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ABSTRACT

Developed in a workshop by principals, counselors, and teachers, this handbook is designed to serve as a guide for program implementation and to present an orientation to the pre-industrial preparation program. The primary goal of the program is to help academically deprived students improve their basic verbal, scientific, and mathematical skills by correlating the specific occupational experiences to these academic skills. Three new subprograms are offered to students: (1) to take employment at entry-level jobs on graduation, (2) to move toward occupational specialization at community colleges, trade and technical schools, or in apprenticeships, and (3) to continue on into preparation for professions. Sample occupational units of instruction are included in the areas of: (1) Business, (2) Personal/Public Service, (3) Food Service, (4) Construction/Civil Technology, (5) Electrical/Electronics, (6) Mechanical, and (7) Graphic Arts. Lists of standard tools and equipment, sample plans for implementation, task analysis information, a program evaluation instrument, courses of study, and a behavior description scale are appended. (GEB)

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pre-industrial preparation program handbook

vocational-technical education

OFFICE OF INSTRUCTIONAL SERVICES • DEPARTMENT OF EDUCATION • STATE OF HAWAII
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VT 015 755

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PREFACE

Vocational-Technical Education in Hawaii's secondary schools has evolved to bring new emphasis and relevance to an individual's occupational pursuit. Spurred by the notion that "children must want to learn or they will not learn at all," the restructured vocational-technical program customizes the instructional programs to motivate the students.

More specifically, the Pre-Industrial Preparation program, designed for the underachieving, disadvantaged student tailors the curriculum to the individual by incorporating mathematics, science, and English in an occupational course of study. This program strengthens the student's basic academic skills while he is pursuing his occupational interests. The intent of the program is to increase and enhance the options available to the program participants--be it immediate entry into an occupation, to continue his education and training in the community colleges, trade schools or apprenticeship programs, or to aspire toward a profession.

Shiro Amioka

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Superintendent of Education

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INTRODUCTION

This handbook was developed to serve as a guide for program implementation as well as to present an orientation to the Pre-Industrial Preparation Program in Vocational-Technical Education for the State of Hawaii.

The primary goal of the Pre-Industrial Preparation Program is to help academically deprived students to improve their basic verbal, scientific, and mathematical skills by correlating the specific occupational experiences to these academic skills. This program is designed to increase students' options by equipping them for employment and for pursuing their occupational interests in post-secondary schools.

The materials included in this publication were first developed and organized by a workshop group in the summer of 1969 with principals, counselors, teachers, district and state personnel participating. The original materials were refined by workshop groups in the ensuing summers of 1970 and 1971. Knowledgeable consultants whose names appear on a previous page gave the workshop groups invaluable advice and leadership.

An overall description of the total secondary vocational-technical education program; the description of the Pre-Industrial Preparation program; the delineated roles and responsibilities of all program participants; sample occupational units of instruction and other pertinent information are presented to assist administrators and other program personnel implement the Pre-Industrial Preparation Program.

It is hoped that this handbook will be of much value to high schools and districts implementing the Pre-Industrial Preparation Program. It should also be helpful to intermediate schools for guidance purposes.

AN OVERVIEW OF HAWAII'S VOCATIONAL-TECHNICAL EDUCATION PROGRAM IN THE SECONDARY SCHOOLS

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THE RATIONALE

The rapid development and impact of technology greatly affect the lives of every person in our society today, but even more so that segment of young people whose skills, intelligence, and judgment have not yet been adequately developed. Hence, there is an urgent need now, and in the years ahead, to prepare these young people with an adequate education to meet the requirements needed to fill the vast number of jobs spawned by modern technology.

The basic philosophy of Vocational-Technical Education is to prepare the vast number of young men and women to cope with the extraordinarily wide range of responsible jobs that must be filled. It is to perform this particular mediating task that the restructured Vocational-Technical Education program was developed in our state. The needs of the individuals as well as of society are served simultaneously by making students the beneficiaries of this program.

PROGRAM DESCRIPTION

The total Vocational-Technical program is designed to offer three new subprograms to fulfill the needs, wishes, and potentialities of differing individuals in their preparation for the opportunities that exist today and will exist tomorrow in the working world. Basically, all three programs are designed to increase the options available to high school students. These options are: (1) to take employment at entry-level jobs; (2) to move toward occupational specialization at community colleges, trade and technical schools, or in apprenticeships; and (3) to continue on into preparation for professions.

Each of the three programs has its own specific emphasis although the common elements among them are the actual occupational experiences and a balance of academic subjects to go along with these experiences. The three programs and a brief description of each are:

I. Preparatory Vocational and Technical Education

A. The Pre-Industrial Preparation Program focuses on the improvement of basic verbal, mathematical and scientific skills through correlating them with concrete occupational experiences. This program is primarily for the underachieving, disadvantaged students. It is programmed to help these students to see the importance and usefulness of academic skills for performing job tasks.

B. The Introduction to Vocations Program is guidance oriented and includes knowledge about possible career opportunities as well as experiences in the various clusters of occupations. This program appeals to students with varying abilities, interests, and aptitudes as opposed to any one level of ability. In other words, a student with scientific aptitudes may pursue his interests in a highly technical field of work while another who likes to work with people may explore the opportunities in the social services.

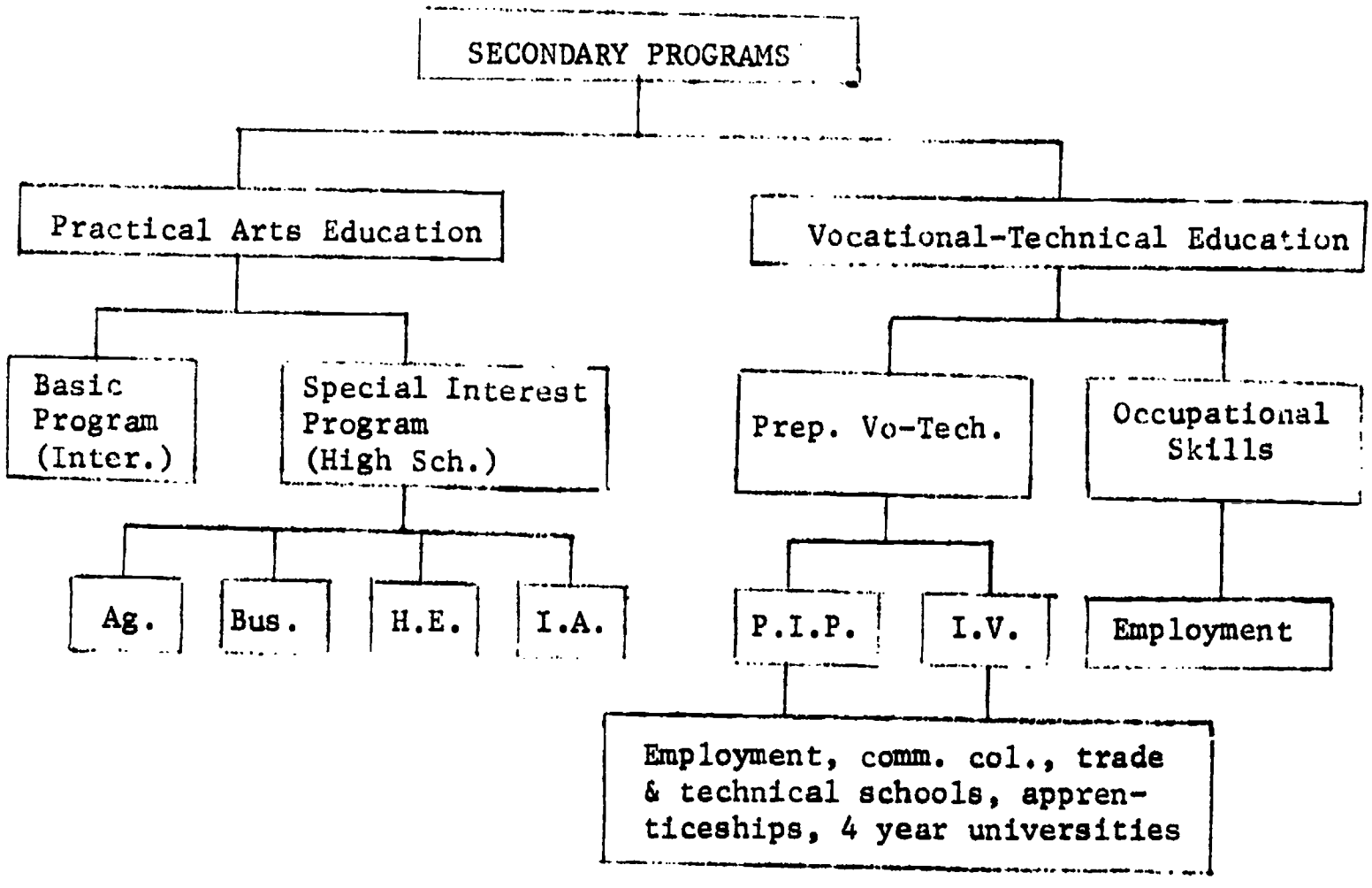
I.. Occupational Skills

The Occupational Skills Program is designed to develop specific job skills and is for the handicapped students enrolled in the high schools. The special education teacher and the occupationally competent instructor will work together to help these students become employable.

The occupational experiences for the above programs will be available to an individual in eight large clusters of occupations. They are: (1) Business Occupations; (2) Personal/Public Service Occupations; (3) Health Occupations; (4) Food Service Occupations; (5) Electrical/Electronics Occupations; (6) Construction/Civil Technology Occupations; (7) Mechanical Occupations; and (8) Technical Graphics Occupations.

PROGRAM STRUCTURE

It must be noted here that the Vocational-Technical Education program is separate and apart from Practical Arts Education. The Practical Arts program is concerned with helping the individual to respond sensitively to technological developments and to cope effectively with the consequences in his personal life. The Vocational-Technical program, on the other hand, is aimed at motivating and enabling the individual to proceed purposefully in an occupational pursuit by increasing his basic academic skills and developing entry-level proficiency in a cluster of occupational skills.



(Note: The above chart indicates only the program structure and does not reflect program personnel functions nor subject matter.)

MASTER PLAN GUIDELINES FOR THE DEVELOPMENT AND IMPLEMENTATION OF THE VOCATIONAL-TECHNICAL EDUCATION PROGRAM AT THE SECONDARY SCHOOL LEVEL

The total Vocational-Technical program was developed in accordance with the Master Plan for Vocational Education which established the following guidelines:*

1. Focus on occupational needs of individuals rather than the categories of occupations; congruence between the two is clearly recognized.

2. Serve persons in all categories of occupational life.

3. Give priority to those with special needs.

4. Plan and structure to enable individuals to fulfill their personal and social goals at the same time that career goals are being achieved.

5. Treat as total education of the individual rather than training in technical skills.

6. Increase the amount of technical content in preparing workers for technical occupations.

7. Include guidance and counseling.

8. Plan Vocational-Technical Education Program as open-ended, continuous education with its major responsibility being to develop readiness and capacity for lifetime learning and re-learning of occupational knowledge.

9. Organize for maximum articulation from the secondary level to the community colleges and to four-year institutions.

10. Increase the options available to individuals.

11. Provide basic skills and concepts which apply universally to clusters of occupations.

12. Improve image and prestige through counseling, research, and other techniques.

*A State Master Plan for Vocational Education, February 1968.

THE PRE-INDUSTRIAL PREPARATION PROGRAM

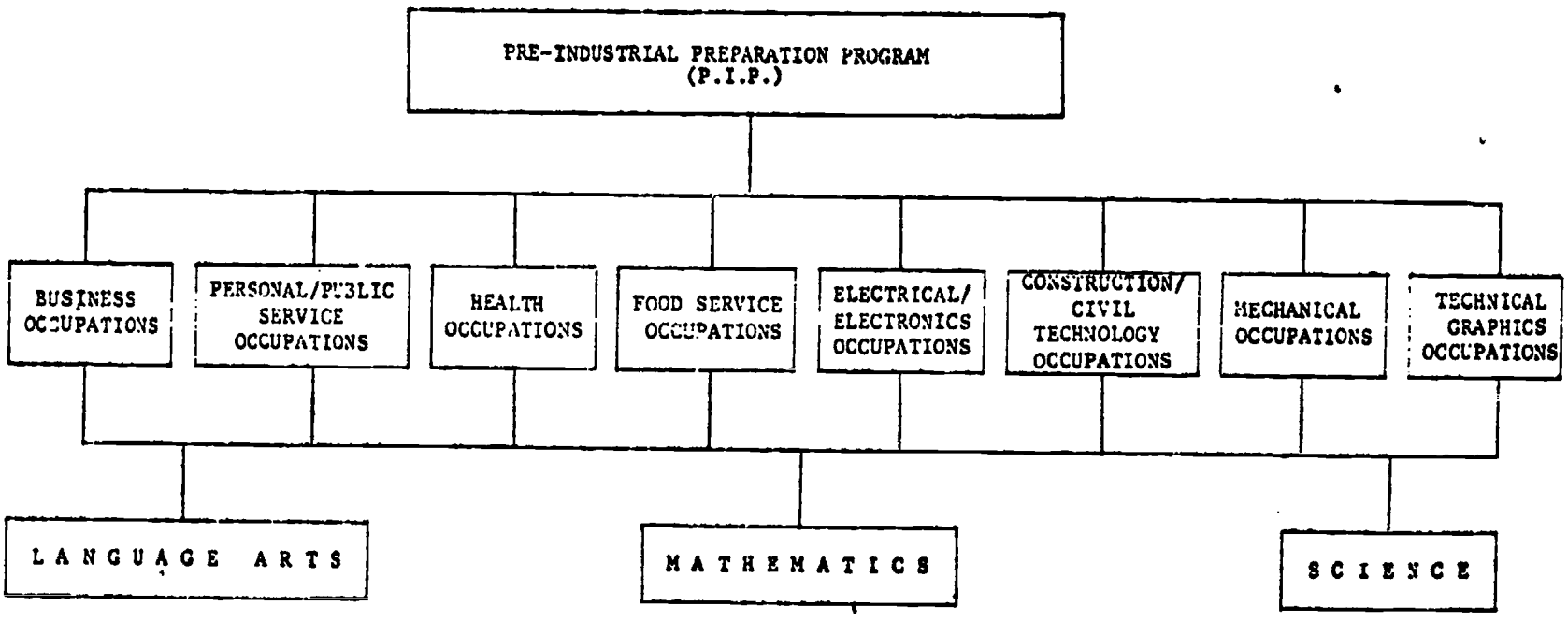
DESCRIPTION OF THE PRE-INDUSTRIAL PREPARATION PROGRAM

This program is designed to help those individuals in high school who are identified as academically deprived (the disadvantaged, the culturally deprived and the underachievers), to improve their basic verbal, scientific and mathematical skills by correlating the concrete occupational experiences to these basic skills. For example, in working with sheet metal in the metals technology course, the students work with decimals, fractions, and problems found in geometry and trigonometry and use these mathematical concepts to produce blueprints and drawings. These plans are then converted into the actual product (i.e., an aluminum duct). In science, a study of air flow and air pressure is interwoven into the course work. The whole project is finally written and reported in English class sessions.

Job tasks and skills are very much a part of this program since occupational experiences are the basic means to the end. The occupational experiences are directed by teachers with occupational competencies, and the academic skill development is under the respective subject matter teachers. All teachers participating in this program, together with the counseling and guidance personnel, comprise the closely coordinated professional team for this program in each school. While the "hands-on" activities in the beginning are confined to simulated laboratory situations, cooperative work experience is part of the latter phase of the program to provide actual work station experiences within industry.

The occupational experiences available to an individual in this program are in eight large clusters of occupations. They are: (1) Business Occupations, (2) Personal/Public Service Occupations, (3) Health Occupations, (4) Food Service Occupations, (5) Electrical/Electronics Occupations, (6) Construction/Civil Technology Occupations, (7) Mechanical Occupations, and (8) Technical Graphics Occupations. These eight were identified by studying the community college and other post-secondary program offerings as well as the State and National occupational trends and needs. Every effort is made to provide a continuum for the student if he desires to pursue further education.

The following is a visual presentation of the various content areas in the Pre-Industrial Preparation Program.



OBJECTIVES OF THE PRE-INDUSTRIAL PREPARATION PROGRAM

The objectives of the Pre-Industrial Preparation Program are: (1) to develop the verbal, scientific, and mathematical competencies of Hawaii's academically deprived high school pupils by correlating the concrete occupational experiences to those basic skills, and (2) to develop understandings and skills which will enable these students to enter a selected post-secondary vocational-technical course of study or enter a job with a saleable skill. As a result of instruction in this program, the students should be able to:

Recognize the need for and importance of the verbal, scientific and mathematical skills to work with equipment, tools, materials, and processes in the emerging technology.

Perform entry level tasks within one or more related job families: Business Occupations, Personal/Public Service Occupations, Health Occupations, Food Service Occupations, Electrical/Electronics Occupations, Construction/Civil Technology Occupations, Mechanical Occupations, and Technical Graphics Occupations.

Individual student progress will be evaluated by the CTBS scores in language (reading and writing), mathematics and science. The program effectiveness will be measured by the increase in percentage of these students who enter a selected post-secondary vocational-technical course of study.

ADMINISTRATIVE AND STAFF FUNCTIONS FOR PROGRAM IMPLEMENTATION

I. THE ROLE OF THE STATE AND DISTRICT STAFF

The State Vocational-Technical Education staff and the district staff cooperatively must provide direction and support for the implementation of the program.

Specifically, the roles of the State and District personnel are:

A. Dissemination of Program Information

1. Provide Pre-Industrial Preparation Program information to all interested groups.

2. Develop an implementation handbook and other informational materials.

3. Conduct orientation meetings.

B. Provision for In-Service Education

1. Conduct implementation workshops for school personnel.

2. Provide training for program participants.

3. Direct and guide school administrators and teachers in program development.

C. Promotion of Program to Meet Student Needs

1. Provide supportive services.

2. Assist with and support needs assessment studies.

D. Acquisition of Resources for Program

1. Determine program needs and recommend levels of funding.

2. Develop state and district level budgets for program to be incorporated in the Department of Education budget.

3. Allocate available resources for administrative approval.

E. Evaluation of Programs

1. Monitor school level programs regularly.

2. Provide consultative services as needed for improvement of program facilities, equipment, personnel and instructional materials.

F. Provision for Accountability

1. Coordinate data gathering for management decisions and for reporting.

2. Understand and follow through with accounting procedures.

3. Assist schools to increase cost-benefit ratios.

II. THE ROLE OF THE ADMINISTRATOR

In initiating and developing the Pre-Industrial Preparation Program in any high school, administrative support and guidance are imperative and must be deemed as important factors in the success or failure of the program. In order to successfully implement the Pre-Industrial Preparation Program, the administrator must consider such factors as: coordination of the program; the selection and development of special faculty; scheduling; provisions for counseling and guidance services to students and parents; required physical facilities; budgeting; and the use of advisory committees.

A. Coordination of the Program

1. Select team leader or leaders from the following:

   a. Vice Principal
   b. Department Head
   c. Vocational Counselor
   d. Master Teacher in the program

2. Provide time in school day for leader(s) to carry out assigned duties.

3. Select and assign personnel to the team.

   a. Vocational-Technical Instructors
   b. Mathematics Instructors
   c. Science Instructors
   d. English Instructors
   e. Counselor

   Note: The members of the team should be selected on the basis of compatibility as well as competence. Vocational-technical instructors must have industry experience and occupational competence in the area which they teach. (Refer to State Plan for the Administration of Vocational Education for minimum requirements.)

4. Provide for in-service training.

B. Assessment of Equipment and Facilities

Determine facility and equipment needs for program implementation.

a. Remodel existing plant if necessary
b. Recommend new construction when needed
c. Develop equipment and supply lists to be requisitioned.

C. Utilization and Assignment of Facilities

1. Consider proximity of classroom and laboratories.

2. Consider flexibility in teaching modes (team teaching, individualized study, etc.).

D. Utilization of School Personnel for Planning

1. Allow for flexibility to affect the best team teaching operation and planning.

2. Schedule planning period at the same time for all team members for maximum correlation.

3. Involve Pre-Industrial Preparation team members and student(s) in planning for the program.

E. Formulation and Control of Budget

1. Select equipment comparable to that used in industry and necessary to meet program objectives.

2. Obtain necessary supplies essential to carry out an occupational experience.

3. Comply with inventory procedures outlined in state guidelines.

4. Consider requests and set priorities for capital improvement projects.

F. Evaluation of Program

1. Evaluate the program continuously.

2. Make formal assessment at the end of every school year.

Note: Evaluation should be a team effort.

G. Organization of the Advisory Committee(s)

1. Select the committee members by occupational areas or for the entire Pre-Industrial Preparation Program.

2. Orient the committee members to the Pre-Industrial Preparation Program.

3. Delineate clearly the individual responsibilities of each member.

Note: Emphasize the use of members as resource people.

III. THE ROLE OF THE COUNSELORS

Counselors are a necessary and vital part of the total Pre-Industrial Preparation Program. The concerns of the student as a total person are of paramount importance.

The following are specific duties and role of the counselor:

A. Identification and Selection of Students

1. Identify students

a. Disadvantaged

(1) Educational
(2) Cultural
(3) Economic
(4) Social

b. Underachievers -- identification based on available test data (SCAT/STEP)

2. Select students

a. Teacher's recommendations
b. Counseling interviews
c. Student test scores

B. Provision for Testing of Students

1. Administer CTBS (Form Q--Level 4) pre-test in September and post-test in April.

a. Pre-test -- Compile test scores for academic teacher. Test scores to be used to provide information for individual instruction in areas of student weaknesses.

b. Post-test -- Develop individual profile chart showing student improvement from beginning of school year to the end of the school year.

2. Recommend teacher-made tests -- pre and post for measuring student growth in specific subject areas.

C. Provision for Specialized Vocational Counseling and Guidance

1. Have individual and group counseling sessions at least two hours per week.

2. Conduct more informal type sessions with students.

3. Make available information on various vocations.

4. Gather and disseminate information on available post-secondary occupational preparation programs.

5. Assist with and/or coordinate resource speakers, visitations, field trips, etc.

6. Schedule periodic staff counseling.

7. Develop a student profile (test scores, interests, strengths, weaknesses, etc.) for counselor, teacher, and pupil use.

8. Arrange a schedule with team members for group and individual counseling.

D. Identification of Program Needs

1. Make provisions for full-time vocational counseling services.

2. Attempt to obtain services of an educational aide and/or a secretary for the team.

3. Request for:

   a. Test materials -- CTBS, booklets, answer sheets, corrections, etc.
   b. Occupational Kits -- SRA, Careers, chronicles, digests, etc.
   c. Materials for resource center -- Catalogs, films, etc.
   d. Supplies -- Postage stamps, paper, folders, etc.
   e. Equipment -- Filing cabinets, typewriters, tape recorders, etc.

E. Participation in Evaluation

1. Administer attitudinal survey (Behavior Description Scale--Ohio State University), pre and post.

2. Arrange for students' evaluation of program.

3. Conduct follow-up study of graduates.

   a. How many are pursuing further education and training
   b. How many are employed
   c. Others

4. Document observable behavioral changes through conferences with students and teachers.

F. Participation in Public Relations

1. Carry on public relations programs.

   a. PTA groups
   b. Local businesses
   c. Faculty

d. Community groups
e. Teacher organizations
f. Other professional organizations
g. Others

2. Attend conferences -- State, district and school level meetings pertaining to vocational education.

IV. THE ROLE OF THE RELATED SUBJECT TEACHERS

The success of the Pre-Industrial Preparation Program depends on how well the subject area specialists (English, Mathematics, Science) coordinate their instructional activities with the behavioral objectives of the occupational instructional units in the areas of automechanics, building construction, and others.

A. Development of Coordinated Instructional Units

1. Prepare objectives for individualized instruction in behavioral terms.

2. Adjust instructional activities to meet a student's needs as they relate to the occupation of his choice.

3. Develop instructional materials suitable for disadvantaged learners.

B. Identification of Program Needs

1. Prepare budget for his specific instructional area.

2. Request equipment, supplies, and instructional materials for the respective instructional program.

C. Coordination of Program

1. Plan and meet regularly as a team with other related subject teachers, vocational counselors and the vocational-technical teachers.

2. Plan unit of instruction with vocational-technical teachers.

3. Visit the vocational-technical programs to gain understanding of student needs.

D. Participation in Evaluation

1. Prepare test materials for instructional units.
2. Keep records of student progress (student profile).
3. Schedule conferences with vocational counselor.

V. THE ROLE OF THE VOCATIONAL-TECHNICAL TEACHERS

The Pre-Industrial Preparation Program primarily revolves around the vocational-technical instructional units. As such, the occupational experiences planned for students by the vocational-technical teachers are of prime importance to the success of the program. Instructional units must be designed to fulfill the needs, interests, and potentials of the students for whom this program is basically structured. Maximum correlation and integration of occupational job experiences with English, Mathematics, and Science will be necessary to achieve the goals of the program.

The following are specific duties and role of the vocational-technical teachers:

A. Development of Coordinated Instructional Units

1. Prepare units of instruction (individualized or group) in measurable behavioral terms.

2. Perform job task analysis. Identify operations for planned instruction.

3. Select and/or develop occupational and resource materials for instructional units.

4. Select and/or prepare test materials for instructional units.

5. Maintain records of student's progress.

6. Recommend course offerings as community needs and student interest indicate.

7. Identify minimum competencies required for job-entry or occupational specialization.

B. Management of Resources

1. Prepare a budget for the vocational-technical phase of the program including maintenance, equipment, supplies and instructional materials.

2. Prepare and maintain up-to-date inventories of all equipment and supplies.

3. Set up control system for laboratory management.

4. Label all equipment--federally funded and state funded.

C. Coordination of Program

1. Plan and meet regularly as a team with related subject teachers and vocational counselors.

2. Assist related subject teachers in understanding occupational concepts.

3. Assist related subject teachers in planning programs of instruction.

4. Work with advisory committee to update occupational instructional units.

D. Participation in Program Evaluation

1. Prepare test materials for instructional units.

2. Keep records of student progress (student profile).

EXAMPLES OF GENERAL AND SPECIFIC OBJECTIVES ILLUSTRATING THE CORRELATION OF OCCUPATIONAL AND ACADEMIC SKILLS

MATHEMATICS IN THE PRE-INDUSTRIAL PREPARATION PROGRAM

General Objectives

- Increase skills in fundamental operations of arithmetic.
- Develop ability to meet mathematical situations effectively in an occupational area.
- Develop ability to use simple formulas, equations, ratios, and proportions.
- Increase understanding of direct measurements.
- Develop skills in elementary problem solving techniques.
- Develop a vocabulary rich enough to understand and express mathematical ideas.
- Develop ability to think through a quantitative situation, make sound judgment about it, and appraise the reasonableness of the judgment.
- Develop an appreciation for the role that mathematics plays in making progress in an occupational area.

Examples of Specific Objectives

Power and Auto Technology

- Given a micrometer, the student will be able to measure the size of a piston with accuracy of one thousandths of an inch (1/1000).
- Given a set of differential gears, the student will be able to determine the gear ratio of the differential to the closest hundredths.
- Given a flat-rate manual and a parts manual, the student will be able to quote prices of the parts cost of different types of jobs with 100% accuracy.
- Given the dimensions of an engine, the student will be able to find the size of the engine to the closest cubic inch.
- Given the job that takes X number of hours, the student will be able to charge the customer the correct amount when charging Y dollars per hour.

Building Construction Technology

. Given the length and height of a desired hollow tile wall, the student will be able to calculate the number of tile blocks of specific given dimensions needed.

. Given the dimensions of a book shelf, the student will be able to calculate the amount of board feet of lumber to be used.

. Given a ruler and a piece of wood, the student will be able to measure the length and width of the wood to be nearest sixteenth of an inch.

. Given a tape measure, the student will be able to calculate the area of the floor.

. Given the number of hours a student has worked and the rate per hour, he will be able to calculate his wages.

ENGLISH IN THE PRE-INDUSTRIAL PREPARATION PROGRAM

General Objectives

. Develop skills in spelling, pronouncing, defining, and using technical terms.

. Develop ability to effectively communicate orally with people.

. Develop skills in writing short, orderly reports on observation using technical and scientific data.

. Develop ability to write effective sentences.

. Develop an appreciation and interest in reading.

. Develop skills in listening effectively.

Examples of Specific Objectives

Power and Auto Technology

. Given a list of automotive terms, pronounce and define the terms with 80% accuracy.

. Given a simulated job situation, place an order for automotive parts through the use of a telephone.

. Given a set of oral instructions, perform the desired task according to the instructions.

. Given an automotive catalogue and a list of auto parts, correctly complete an order form for purchase.

SCIENCE IN THE PRE-INDUSTRIAL PREPARATION PROGRAM

General Objectives

- Develop basic laboratory skills in manipulating scientific equipment.
- Develop an understanding of the scientific principles involved in technical processes.
- Develop ability to record scientific and technical observations accurately.
- Be able to relate scientific concepts to technical operations and processes.
- Develop the ability to solve scientific and technical problems by formulating sound judgment through investigative procedures.
- Develop an understanding of scientific terminology.

Examples of Specific Objectives

Power and Auto Technology

- Given different grades of crank case oil, determine the weight of each grade of oil through investigative procedures.
- Given the theory on brakes, relate the scientific principles of hydraulic pressure.
- Given a problem in carburation, list the investigative steps to analyze and solve the problem.
- Relate Newton's Laws to the operation of an automobile.

OCCUPATIONAL SKILL DEVELOPMENT THROUGH LANGUAGE SKILLS

The following are specific examples to illustrate the correlation of the vocational subjects to the disciplines of mathematics, science, and English through language skills.

The student will improve his abilities in:

Oral Skills

General Objectives

- To express an idea orally to others.

Behavioral Objectives

- English - Given a hammer, the student will orally describe its use to the satisfaction of the instructor.
- Mathematics - Given a board and a ruler, the student will orally describe its use to the satisfaction of the instructor.

. Science - Given a torque wrench, the student will explain its use and purpose in tightening bolts to the satisfaction of the instructor.

Listening Skills

General Objectives

. To follow oral instructions or directions.

Behavioral Objectives

. English and Mathematics - Given oral instructions in measuring, the student will be able to draw a line 3 inches long with an accuracy of 1/16th of an inch.

. Science - Given oral instructions on how to perform a viscosity test, the student will place the different kinds of oils in rank of order from lightest to heaviest.

Reading Skills

General Objectives

. To read with comprehension, simple written instructions or directions.

Behavioral Objectives

. English - Given a written description of a set of auto tools, the student will be able to identify and select the proper auto tools from a mixed set of tools.

. Mathematics - Given a micrometer for measuring, the student will explain in writing how heat expansion causes metal distortion.

SAMPLE OCCUPATIONAL

UNITS OF INSTRUCTION

BUSINESS OCCUPATIONS: OFFICE

General Description:

Office Education is designed for students who are interested in office occupations as a career. The program content is determined by the needs and interests of the students and the requirements of entry-level jobs or post-high school education. Actual work experience under school and employer supervision is provided through the cooperative education plan.

Major Courses:

Introduction to Data Processing
Advanced Typing
Beginning Shorthand
Advanced Shorthand
Beginning Accounting
Advanced Accounting
Business Machines/Office Practice
Cooperative Office Education

Office Education

Objectives of Office Education

As a result of their learning experiences, students will be able to:

. Operate some of the more widely used office machines.

. Follow instructions, and execute tasks efficiently.

. Improve proficiency through application of office education skills to work situation.

. Identify and use some of the more commonly used accounting systems.

. Perform routine clerical tasks such as handling telephone calls, greeting office callers, handling mail and petty cash, and preparing commonly used business forms, payrolls and inventories.

. Demonstrate accuracy, neatness, and thoroughness in meeting the demands of an office.

. Recognize those personal traits and attitudes which are essential for success in the business world.

. Use and care for office supplies, tools, machines, and office equipment.

. Identify and use some of the more commonly used filing systems.

. Identify some procedures of locating, applying, obtaining, and holding a job.

. Identify applications of electronic data processing to the office.

Basic Knowledge and Skills for Office Work

There are three possible options within the office occupations. They are the clerical, stenographic and accounting occupations. The general units of instruction within all of these are those listed below.

Units of Instruction

- The Role of the Office in Business

  Office Organization
  The Office Worker

- Business Forms

- Office Machines

  Adding and Calculating
  Duplicating

- Recordkeeping

- Typewriting

- Human Relations

- Filing

- Communications

  Telephone
  Written and Oral

- Job Orientation

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to either pursue a post-secondary program for specialization or to enter employment in any of the following occupations:

General Office Clerk
Clerk-Typist
Clerk Stenographer
File Clerk
Bookkeeping Clerk
Mail Clerk
Receptionist
Payroll Clerk
Messenger
Business Machines Operator
Typist
Teller
Timekeeper
Transcribing Machine Operator
Duplicating Machine Operator

Suggested Advisory Committee

Administrator
Subject Teacher
Student Representative
Counselor
Employment Service Representative
Business Representative
Office Worker
Interested Parent

Sample Unit of Instruction: Duplicating Machines

Behavioral Objectives

As a result of their learning experiences, students will be able to:

Clerical Office Work

. Type masters for fluid and stencil duplicating machines.

. Identify and demonstrate the use of the fluid duplicator.

. Identify and demonstrate the use of the stencil duplicator.

. Select the appropriate process and materials needed for reproduction jobs.

. Care and maintain equipment and supplies.

. Operate a dry-copying machine.

Language Arts

. Identify and explain the use of all the operative parts of the fluid duplicator and stencil duplicator in written and/or oral form to the instructor.

Mathematics

. Interpret the operational scales used on the duplicating and stencil duplicating machines.

Science

. Identify the characteristics of the various types of chemicals used in the duplicating machine.

Activities

- Type a paragraph on a spirit master and correct errors neatly, using appropriate method.

  Run off the master on a stencil, making corrections as specified.

- Type a letter on a stencil, making corrections as specified.

- Run off the stencil on a stencil duplicator.

- Demonstrate the use of duplicators to another student.

Evaluation for Sample Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.

- Student performance of activities completed.

- Written examinations.

BUSINESS OCCUPATIONS: DISTRIBUTIVE

General Description:

Distributive Education is a program which provides students with the opportunity to explore the field of marketing and distribution, and to build a foundation for continuing education related to distribution. A cooperative effort requiring the joint interest and efforts of the school and the distributive businesses in the community is provided through a cooperative education plan. The classroom instruction is planned around the competencies required in the field of marketing and distribution.

Major Courses:

Introduction to Sales and Marketing
Salesmanship
Business Principles and Management
Business Law
Advertising
Cooperative Distributive Education

Distributive Education

Objectives for Distributive Education

As a result of their learning experiences, students will be able to:

. Enter and advance in distribution and marketing careers.

. Identify work habits and attitudes which are essential to success on the job.

. Have a sense of responsibility toward the business and the employer.

. Set realistic goals in terms of his interests, abilities, and potentials.

. Apply operational techniques in distribution and marketing.

. Assume socio-economic responsibilities and ethical conduct that accompany the right of the individual to engage in distribution, and to participate in a competitive free enterprise economy.

. Describe the contributions that the field of distribution and marketing makes to the individual and society.

. Identify the relationship between school and vocational objectives.

. Describe the varied career opportunities in distribution.

. Describe the consumer and his role in a viable economy.

Basic Knowledge and Skills for Distributive Work
Units of Instruction

- Channels of Distribution
- Techniques of Selling
- Advertising and Sales Promotion
- Visual Merchandising/Display
- Cashiering
- Use of Telephone
- Using Adding and Calculating Machines
- Human Relations in Business

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to either pursue a post-secondary program for specialization or to enter any of the following occupations:

Sales Clerk
Advertising Clerk
Cashier
Telephone Operator
Marketing Clerk
Stock Clerk
Courtesy Boy
Warehouseman
Delivery Clerk
Gift Wrapper
Shipping and Receiving Clerk

Suggested Advisory Committee

Administrator
Subject Teacher
Student Representative
Counselor
Business Representative
Distributive Worker
Interested Parent

Sample Unit of Instruction: Cashiering

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

- Greet the customer appropriately, and with a smile.
- Handle merchandise with care.
- Record the sale on the cash register accurately.
- Receive money and give change accurately.
- Place merchandise in packages according to specified practices.

. Select appropriate supplies needed to wrap items according to specified practices.

. Answer inquiries a customer might have, pleasantly and clearly.

Activities for Unit

. Practice the use of the cash register.

. Practice giving change with another student as the customer.

. Wrap different-sized and shaped boxes.

. Demonstrate bagging products of different size, shape, texture, and weight.

. Demonstrate use of the cash register and give correct change.

. Demonstrate packaging items of varied sizes.

. Demonstrate wrapping a package for mailing.

. Demonstrate wrapping a gift package.

. Weigh a package on a postal scale.

. Weigh an item on a produce scale.

Evaluation for Unit

. Instructor observations of student behaviorial changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

BUSINESS OCCUPATIONS: AGRICULTURAL TECHNOLOGY (AGRI-BUSINESS)

General Description:

The Agricultural Technology course of study provides students with the technical knowledge and skills needed to pursue occupations related to plant and animal life for economic and ecologic purposes and other agricultural activities allied with the distribution field. Financial and operational management of agricultural enterprises is emphasized. Innovative and experimental agricultural projects which might result in economically valuable products are encouraged among students. Environmental considerations are subsumed in all aspects of the program. This program also prepares students for post-secondary agricultural programs of their choice. Instruction is individualized whenever feasible and instructional materials are correlated with occupational job tasks.

Major Courses:

Agricultural Technology I
Agricultural Technology II
Cooperative Agricultural Education

Agricultural Technology

Objectives of Agricultural Technology

As a result of their learning experiences, students will be able to:

- Use the skills and knowledge acquired to successfully engage in plant growth and development activities.
- Use the skills and knowledge acquired to successfully engage in animal growth and development activities.
- Apply the agricultural related competencies in processing and distributing agricultural products.
- Apply management principles and practices as they relate to various agricultural enterprises.
- Utilize the knowledge from plant science, animal science, soil science, agricultural mechanics, and agricultural management for the development of new economically valuable agricultural products and services.
- Effect innovations in various agricultural practices.
- Understand ecological and environmental implications of various agricultural activities and select methods and techniques least detrimental.
- Apply financing principles and practices to agricultural enterprises.

Basic Knowledge and Skills for Agricultural Technology
Units of Instruction

- Plant and Animal Genetics
- Plant Growth and Development
- Animal Growth and Development

. Processing and Distribution of Agricultural Products
. Management in Agricultural Enterprises
. Agricultural Machinery and Equipment
. Ecology and Agriculture
. Research and Experimentation in Agriculture
. Technological Development in Agriculture
. Financing Agricultural Enterprises

With the learning experiences provided by the units of instruction as outlined above, the student will be equipped and have the option to further pursue his interests in post-secondary programs or to enter any of the following occupations:

Farm Hand
Animal Husbandryman
Irrigator
Farm Machine and Equipment Maintenance Man
Farm Equipment Operator
Farm Equipment and Supply Salesman
Agricultural Technician
Farm Supervisor
Farm Manager
Produce Cooperative Manager
Produce Dealer
Packing, Milling and Processing Plant Supervisor or Manager
Rancher
Farmer

Suggested Advisory Committee for Agricultural Technology

Administrator
Subject Teacher
Student Representative
Counselor
Interested Parent
Extension Service Agent
Young Farmer
FFA Chapter President

Sample Unit of Instruction: Animal Growth and Development

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

. Compute the nutritional value of various feeds and develop a ration for a specific class of livestock based upon efficient feeding practices.

. Demonstrate knowledge of animal physiology through application and use of approved practices in handling and caring for animals.

. Identify environmental factors which determine similarities and differences as they apply to a specific class of animals.

. Recognize the symptoms of the most common animal diseases and use control measures to eradicate the cause or causes as they apply to a specific class of animals.

. Control common pests as they apply to a specific class of animals.

Language Arts

- Write a project plan for raising 25 broilers from day old to maturity.

Science

- Describe the functions of major nutrients in the growth and development of broilers for market.

Mathematics

- Calculate the cost of producing a pound of poultry meat.

Activities of Unit

- Carry out experiments to show the effects of balanced and non-balanced rations using small animals.
- Raise a set of broilers on wire floor and another on litter to compare growth and development.
- Administer preventive as well as curative antibiotics to a specific class of animals.
- Design a program to promote good health and safety of farm animals.
- Identify and treat animals for internal as well as external parasites and pests.
- Plan and carry out an animal project individually or as a group.

Evaluation of Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.
- Student performance of activities completed.
- Written and oral examinations.

BUSINESS OCCUPATIONS: ORNAMENTAL HORTICULTURE (AGRI-BUSINESS)

General Description:

This occupational area is designed to offer students the opportunity to acquire knowledge and skills in the field of Ornamental Horticulture to enable them to be employed in agri-business and related service occupations. This program will also prepare students to pursue their interests in post-secondary programs if they so desire. Instruction is individualized and instructional materials are correlated with occupational job tasks.

Major Courses:

Ornamental Horticulture I
Ornamental Horticulture II
Cooperative Agricultural Education

Ornamental Horticulture

Objectives of Ornamental Horticulture

As a result of their learning experiences, students will be able to:

. Use horticultural competencies to propagate, nurture, process, and market plants for ornamental purposes.

. Apply conceptual knowledge in turf management, plant nursery management, floriculture, floristry, landscape gardening, and other activities related to plant and floral production, processing, distribution and marketing.

. Use, care for and repair horticultural tools and equipment safely.

. Explain use and characteristics of chemical products used in horticulture.

. Construct and use efficient and effective plant growing structures such as green houses, mist boxes, benches and plant boxes.

. Establish and maintain a lawn or turf.

. Develop a landscape plan for a typical single dwelling or an urban center development.

Basic Knowledge and Skills for Ornamental Horticulture
Units of Instruction

. Plant propagation
. Plant growth and development
. Horticultural tools and equipment
. Plant growing structures
. Processing, marketing and distribution of horticultural products
. Chemical products and ornamental horticulture
. Turf management
. Landscape planning and design
. Technological developments in horticulture
. Management practices in ornamental horticulture enterprises

With the learning experiences provided by the units of instruction as outlined on the previous page, students will be equipped and have the option to either pursue a post-secondary program for specialization or enter any of the following occupations:

Groundskeeper
Nurseryman
Landscape Gardener
Cut Flower Grower
Horticulture Supplies Salesman
Florist
Horticulturist
Landscape Designer

Suggested Advisory Committee for Ornamental Horticulture

Administrator
Subject Teacher
Student Representative
Counselor
Industry Representative
Ornamental Horticulture Worker
Interested Parent
Extension Service Agent
Young Farmer
Future Farmers of America Chapter President

Sample Unit of Instruction: Plant Propagation

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

- Select the most practical method of propagation for specific species of plant.
- Germinate different plant seeds.
- Propagate plants by cutting, layering, grafting, and budding.

Language Arts

- Have the vocabulary needed to describe plants and their parts.

Science

- List and explain the various environmental factors influencing rooting of cuttings.

Mathematics

- Calculate germination percentage of seeds.

Activities of Unit

. Compare reproductive characteristics of different species of plants.
. Conduct seed germination experiment under varying environmental conditions.
. Propagate plants by various types of cuttings.
. Experiment with root inducing hormones.
. Graft and bud ornamental plants.
. Air layer various ornamental plants.
. Demonstrate plant tissue culture.

Evaluation of Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

PERSONAL/PUBLIC SERVICE OCCUPATIONS: PERSONAL SERVICE

General Description:

This is an instructional program to prepare students for employment in personal service occupations. It provides basic knowledge and competencies for Hotel, Motel Housekeeping or Child Care Services. It also gives students exploratory experiences to enable them to pursue further education and training within these occupational areas if they so desire.

Major Courses:

Option I
Hotel & Motel Housekeeping

Option II
Child Care Services

Child Care Services

Objectives for Child Care Services

As a result of their learning experiences, students will be able to:

- Recognize that child care and guidance are important to child growth and development.
- Recognize and provide for the basic physical, social, emotional, and intellectual needs of children.
- Cope with child behavior arising from various emotions.
- Utilize techniques which encourage children's participation in free play.
- Practice good habits of health and safety.
- Identify and provide for the nutritional needs of children.
- Keep equipment and supplies clean and orderly.
- Have skills in the area of child care.
- Explore and be knowledgeable about wage-earning opportunities in child care and apply for employment.

Basic Knowledge and Skills for Child Care Services
Units of Instruction

- Job orientation in child care services

  Nature of employment in child care and guidance
  The successful employee

- Physical needs of children

  Physical growth and development of the child
  Physical care of young children

. Guidance of children

Social and emotional development
Psychological development
Guidance practices of young children

. Child play and learning

Intellectual development of the young child
Creative activities through music, art, literature and science

. Health and safety of children

Safety of children
Health of children

. Nutritional needs of children

Nutritious meals for children
Development of good eating habits

. Appropriate environmental conditions for children

Physical climate of the child care facility
Maintenance and care of equipment and supplies for children

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and will have the option to further pursue their interests in post-secondary programs or to enter any of the following occupations:

Baby sitter
Nursery school worker
Assistant supervisor of day care center
Nursery school teacher
Nursery school administrator

Suggested Advisory Committee for Child Care Services

Administrator
Subject Teacher
Student Representative
Counselor
Health and welfare agency representative
Public and private nursery school representative
Child care service worker
Interested parent

Sample Unit of Instruction: Creative Activities Through Literature

Behavioral Objectives

As a result of their learning experiences, students will be able to:

Child Care Service

- Develop and list criteria for the selection of books and stories for young children.
- Select appropriate story book for a preschooler (3-4 years old).
- Read a story to a child.
- Use flannel board for story telling.

Language Arts

- Look up unfamiliar words in dictionary.
- Pronounce unfamiliar words and know definitions.
- Perfect oral reading technique through use of tape recording.

Activities for Unit

- Visit children's library or book store.
- Look for and select story books for preschoolers using criteria set up by class. (Ex: age group, size of book, print on page, illustrations, etc.)
- Practice story book reading and time it; use tape recorder or sympathetic ear.
- Practice reading story books to selected audience of preschoolers.
- Evaluate activity using appropriate check sheet.

Evaluation of Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.
- Student performance of activities completed.
- Written examinations.

FOOD SERVICE OCCUPATIONS: FOOD SERVICE

General Description:

This is an instructional program to orient students to the hospitality and food service industry. It provides basic knowledge and competencies fundamental to the food service occupations to enable individuals to further pursue their education and training in food service at the post-secondary level or to enter employment in a food service occupation.

Major Courses:

Food Service I (Nutrition/Basic Food Preparation)

Food Service II (Food Management; Food Preparation and Service; including Cooperative Work Experience)

Food Service

Objectives for Food Service

As a result of their learning experiences, students will be able to:

. Realize the size, diversity and trends of the food service industry.

. Realize the unlimited career opportunities in the food service industry.

. Demonstrate personal qualities essential for job success.

. Understand the legal aspects of employment.

. Apply the principles and skills of commercial food preparation.

. Apply the basic principles of safety and sanitation in food service operation.

. Demonstrate acceptable attitudes and techniques of dining service procedures.

. Produce meals for a variety of clientele.

. Receive and store food and supplies using food industry procedures.

Basic Knowledge and Skills for Food Service
Units of Instruction

. Orientation to the Food Service Industry.

Food Service establishments
Career opportunities in food service
Essential personal qualities
Labor laws and employment policies

. Fundamentals of Food Preparation Skills

Techniques of food preparation
Essential work habits in food services

. Fundamentals of Dining Service and Meal Management

Techniques of dining service
Menu and production planning

. Receiving and Storing Food and Supplies

Facilities for food storage
Procedures for receiving and storing food and supplies

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to pursue further training and education or to seek employment at the entry level in any of the following occupations:

Bakers
Bus boys
Cafeteria managers
Car hops
Caterers
Chefs
Cooks
Cooks' helpers
Counter supervisors
Dietary supervisors
Dining room managers
Hostesses and stewards
Kitchen helpers
Kitchen supervisors
Pantry workers
Store room clerks

Suggested Advisory Committee for Food Service

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Industry Representative
Food Service Worker
Interested Parent

Sample Unit of Instruction: Essential Work Habits in Food Services

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

. Demonstrate sanitary practices in food service activities.

Activities for Unit

Food Service

. Demonstrate proper housekeeping procedures and clean work habits in foods laboratory.

. Display cleanliness rules used by restaurants.

. Take field trip to local food establishment to observe and become familiar with housekeeping procedures.

Language Arts

. Read and interpret policies on grooming, personal cleanliness and health of several local food establishments.

. Discuss insect and rodent control.

. Write short paragraph on the importance of clean work habits in food service.

Mathematics/Science

. Prepare bacteria culture and relate the results to the need for sanitary personal habits especially in the food industry.

. Experiment with various control methods to prevent bacterial growth.

. Calculate the spread of germs and bacteria.

. Discuss the economic losses due to rodent and insect infestations of food and other contamination of foods.

Evaluation for Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

CONSTRUCTION/CIVIL TECHNOLOGY OCCUPATIONS: BUILDING CONSTRUCTION

General Description:

The program of study in this occupational area is designed to provide students with basic experiences in the building construction industry that will equip them for further study in post-secondary programs as well as prepare them for entry level jobs. Instruction is focused on job tasks that are necessary for employment in the field. Individualized work in problem solving activities associated with the construction industry is characteristic of the type of training the students receive.

Major Courses:

Technical Sketching and Interpretation
Building Construction Technology I
Building Construction Technology II (includes Cooperative Work Experiences)

Building Construction

Objectives of Building Construction

As a result of their learning experiences, students will be able to:

- Identify the various occupations within the building construction industry.
- Lay out a site, set foundations, construct floor and wall framing, apply finish, and do other job tasks associated with building construction work.
- Use, care for, and properly handle basic hand tools and equipment.
- Identify, select, and estimate the cost of building materials for a selected job.
- Find, interpret, and apply technical and scientific information that deals with the building construction industry.
- Read and follow building construction blueprints.
- Plan projects to meet building code specifications.

Basic Knowledge and Skills for the Building Construction Industry
Units of Instruction

- Course Orientation -- Laboratory Organization and Management
- Job Orientation in the Field of Construction
- Construction Safety
- Hand and Power Tools
- Orthographic Projection Drawing (Blueprint Reading)
- Construction Materials and Cost Estimation
- Surveying and Laying Out Site
- Seating Foundations
- Framing
- Wall Framing
- Roof Framing and Roofing
- Exterior Wall Covering

. Electrical Wiring
. Plumbing
. Applying Interior Wall Siding
. Installing Ceiling
. Constructing Concrete Slab for Stairway
. Constructing Stairway and Railing
. Applying Interior and Exterior Finishes
. Applying Floor Covering

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to further their education and training in post-secondary programs or to enter any of the following occupations:*

General Construction Worker (Apprentice)
Carpenter (Apprentice)
Cement Mason (Apprentice)
Floor Tile Layer (Apprentice)
Glazier (Apprentice)
Tile Setter (Apprentice)
Electrician (Apprentice)
Plumber (Apprentice)
Roofer (Apprentice)
Painter (Apprentice)
Plasterer (Apprentice)

Suggested Advisory Committee for Building Construction

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Industry Representative
Building Construction Worker
Interested Parent
Employment Service Representative

Sample Unit of Instruction: Exterior Wall Covering

Behavicral Objectives of Unit

As a result of their learning experiences, students will be able to:

Building Construction

. Place and tack a wall siding in position.
. Measure, cut, and install soffit, fascia, and rake.
. Completely nail the wall covering to an existing wall frame.
. Complete the job according to blueprint.

Language Arts

. Define construction terminology.

*In the apprenticeable trades, entry level will be as an apprentice.

- Describe in written and/or oral form the method of constructing the exterior wall covering.

- Explain orally specific building codes and regulations.

Mathematics

- Calculate the amount of materials involved in the construction of the exterior wall.

- Estimate the cost of constructing the wall section.

Science

- Explain the principle of horizontal and vertical planes as it relates to construction.

- Explain the stress tolerance of building materials.

Activities of Unit

- Read job specifications and blueprint of project, using glossary of terms and symbols as reference.

- Study building codes and regulations which apply to the tasks to be performed.

- Measure, cut, and install a corner board according to plans.

- Measure, cut, and install vertical siding on the side wall of the structure according to plans.

- Install soffit, fascia, and rake.

- Bend and install flashing over window.

- Correctly apply the clapboard siding over sheathing.

- Prepare a bill of material for the task.

- Estimate the cost for the job.

Evaluation of Sample Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.

- Student performance of activities completed.

- Written examinations.

ELECTRICAL/ELECTRONICS OCCUPATIONS: ELECTRICAL

General Description:

This occupational area provides experiences which enable students to become familiar with the job tasks that are related to the electrical industries. The program is not aimed at an in-depth development of skills in any one occupation, but is structured to prepare students with the basic skills necessary to enter a number of occupations within the electrical cluster. The instructional plans include various teaching methods and individualized activities which facilitate the structuring of the learning situation as required. Students will be introduced to technical and related content through several methods closely resembling the industrial structure.

Major Courses:

Technical Sketching and Interpretation
Electrical Technology I
Electrical Technology II (includes Cooperative Work Experiences)

Electrical Technology

Objectives of Electrical Technology

As a result of their learning experiences, students will be able to:

. Plan, lay out, install and repair wiring, electrical fixtures, apparatus and control equipment.

. Read and interpret blueprints of electrical wiring and equipment.

. Measure, cut, bend, thread, assemble, and install electrical conduit.

. Pull wiring through conduit.

. Splice wire correctly.

. Connect wiring to lighting fixtures and power equipment.

. Install control and distribution devices such as switches, relays and circuit breakers.

. Test continuity of circuits using standard testing instruments.

. Repair faulty equipment.

. Comply with local electrical codes.

Basic Knowledge and Skills for the Electrical Industry
Units of Instruction

. Orientation
. Job Orientation in the Field of Electrical Occupations
. Electrical Safety
. Electrical Codes
. Electrical Theory

- Electrical Circuits and Laws
- Magnetism
- Electrical Phase Systems
- Instrumentation and Measurements
- Transformers
- Electrical Motors
- Conductors and Raceways
- Branch Circuits and Feeders
- Illumination

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to further their education and training in post-secondary programs or to enter any of the following occupations:*

Electrician (Apprentice)
Electrical Repairman's Helper (or Apprentice)
Lineman (Apprentice)
Cable Splicer
Electric Motor Repairman's Helper
Electrical Appliance Repairman's Helper
Electrical Sales and Service Technician
Transformer Repairman

Suggested Advisory Committee for Electrical Technology

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Industry Representative
Electrical Worker
Interested Parent

Sample Unit of Instruction: Electrical Motors

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

- Explain and apply direct current motor principles.
- Describe and identify shunt motor characteristics.
- Describe and identify compound motor characteristics.
- Describe and identify series motor characteristics.
- Explain and apply three-phase induction motor principles.
- Describe and identify squirrel cage induction motor characteristics.
- Describe and identify synchronous motor characteristics.
- Describe and demonstrate operation of single phase motors.

*In the apprenticeable trades, entry level will be as an apprentice.

Language Arts

. Describe in written or oral form the basic principles of motors.
. Define and distinguish the differences between motors.

Mathematics

. Calculate the speed of a motor.
. Calculate the horse power of a motor.

Science

. Describe the scientific principles involved in the turning of a motor.
. Explain Ohm's Law.

Activities of Unit

. Build a simple motor.
. Visit a motor winding plant.
. Assemble and disassemble different motors.
. Wire a motor for operation.
. Calculate problems related to motors.
. Conduct experiments involving motors.
. View films and filmstrips on motors.

Evaluation of Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

ELECTRICAL/ELECTRONICS OCCUPATIONS: ELECTRONICS

General Description:

This occupational area provides experiences which enable students to become familiar with the job tasks that are related to the electronics industries. The program is not aimed at an in-depth development of skills in any one occupation, but is structured to prepare students with the basic skills necessary to enter a number of occupations within the electronics cluster. The instructional plans include provisions for utilizing various teaching methods and individualized activities which facilitate the structuring of the learning situation as required. Students will be introduced to technical and related content through several methods closely resembling the industrial structure.

Major Courses:

Technical Sketching and Interpretation
Electronics Technology I
Electronics Technology II (includes Cooperative Work Experiences)

Electronics Technology

Objectives of Electronics Technology

As a result of their learning experiences, students will be able to:

. Identify the various occupations within the electronics industry.

. Identify and use the tools and equipment used in the field of electronics.

. Explain the electron theory.

. Calculate problems in electronics circuitry.

. Solder and de-solder components.

. Interpret and read schematic diagrams.

. Use test instruments correctly.

. Describe the basic principles of rectification, amplification, reproduction, oscillation, and transmissions.

. Construct and analyze basic circuits.

. Repair and align various electronic devices.

Basic Knowledge and Skills for Electronics Occupations
Units of Instruction

. Orientation
. Safety Rules and Regulations
. Tools and Machines

. Instrumentation and Measurement
. Basic Electronics Theory and Communication
. Electronic Circuitry and Network Laws
. D. C. Circuits and Applications
. A. C. Circuits and Applications
. Tubes and Semi-Conductors
. Electronic Transmission and Receiving Circuitry and Devices
. Radio and Television Repairs

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to pursue further education and training in post-secondary programs or to enter any of the following occupations:*

Electronic Technician's Helper (or Apprentice)
Radio and Television Repairman's Helper
Electronic Component Assembler
Electronic Sales and Service Technician
Telephone Installer
Control Room Technician
Radar Technician
Protective Signal Repairman
Sound Technician

Suggested Advisory Committee for Electronics Technology

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Business Representative
Interested Parent
Registrar
Electronics Worker

Sample Unit of Instruction: Tubes and Semi-Conductors--Vacuum Tubes

Behavioral Objectives

As a result of their learning experiences, students will be able to:

Electronics Technology

. Describe the diode tube and name some of its uses.
. Construct a power supply circuit.
. Describe a triode and name some of its uses.
. Explain Amplification Factor.
. Explain plate resistance, transconductance, and interelectrode capacitance.
. Describe the tetrode and name some of its uses.
. Construct various circuits to illustrate vacuum tube bias.
. Describe the pentode and name some of its uses.
. List the classes of vacuum amplifiers.

*In the apprenticeable trades, entry level will be as an apprentice.

Language Arts

- Define the various unfamiliar electronic terms found in this unit.
- Report in oral or written form how secondary emission can be minimized in a tube.

Mathematics

- Calculate plate resistance problems of different kinds of tubes.
- Calculate voltage gain for specific tubes.

Science

- Explain the electronic principles involved in vacuum tube bias circuits.
- Explain the principles involved in tube amplification.

Activities

- Perform experiments with diodes and triodes.
- Construct a power supply.
- Perform experiments with tetrodes.
- Measure voltage gains and plate resistance.
- Demonstrate grid bias.
- Calculate amplification gains.
- Construct a simple amplifier.
- Identify the elements within a pentode.
- Test and analyze various kinds of tubes.

Evaluation for Sample Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.
- Student performance of activities completed.
- Written examinations.

MECHANICAL OCCUPATIONS: POWER AND MECHANICS

General Description:

This occupational area offers students occupational experiences which are preparatory to further study and investigation in related post-secondary programs, or as job entry training for those desirous of seeking employment in the automotive and power mechanics industry. The theoretical and practical background necessary to service, repair, and adjust automobiles and other power machine components are provided in classroom and shop activities. Individualized instruction is generally the mode, and the job tasks performed are related to basic occupational skills.

Major Courses:

Technical Sketching and Interpretation
Power and Automotive Technology I
Power and Automotive Technology II (includes Cooperative Work Experiences)

Power and Mechanics

Objectives of Power and Mechanics

As a result of their learning experiences, students will be able to:

. Identify the various occupations within the power and automotive industry.

. Repair, replace and adjust the components of an automobile and other types of power engines.

. Use various electronic testing devices necessary to make repairs and adjustments on the automobile and other power engines.

. Use various hand tools and power equipment necessary to repair and adjust the components of an automobile and other power engines.

. Analyze and repair mechanical and electrical problems in automobile and other power engines.

. Find, interpret, and apply technical information necessary to repair automobiles and other power engines.

. Perform necessary maintenance and service on the various components of the automobile and other power engines.

. Identify materials, tools, equipment, and processes used by the automotive industry.

Basic Knowledge and Skills for Power/Auto Mechanics
Units of Instruction

. Automobile and Shop Safety
. Automobile and Power Motors
. Fuel System
. Lubrication System
. Cooling System

- Exhaust System
- Electrical System
- Ignition System
- Suspension System
- Brake System
- Transmission
- Tune-Up and Troubleshooting
- Body and Fender Repair
- Automobile Painting
- General Care and Maintenance

With the learning experiences provided by the units of instruction as outlined above, students will be equipped and have the option to pursue further training and education or to seek employment at the entry level in any of the following occupations:*

Automotive Mechanics

Automobile Mechanic or Helper
Service Station Attendant
Automobile Tester and Troubleshooter or Helper
Automobile Body and Fender Repairman or Helper
Automobile Painter or Helper
Tire Recapper
Wheel Alignment Mechanic or Helper
Automatic Transmission Mechanic or Helper

Power Mechanics

Small Motor Mechanic or Helper
Motorcycle Mechanic or Helper
Marine Motor Mechanic or Helper
Aircraft Mechanic or Helper
Auxiliary Motor Mechanic or Helper
General Mechanic or Helper
Mechanical Maintenance Man

Suggested Advisory Committee for Power and Mechanics

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Business Representative
Tradesman
Interested Parent

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*In the apprenticeable trades, entry level will be as an apprentice.

Sample Unit of Instruction: Brake System--Removal and Inspection of Brake Drum Assembly

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

Power/Auto Mechanics

. Remove and inspect the brake drum assembly as specified by the automobile manufacturer.

. Replace the brake drum assembly.

. Seek information in various resource books on the brake drum assembly.

Language Arts

. Relate the condition of the brake drum assembly in written and/or oral form to the instructor.

. Explain in written or oral form the procedure for removing the brake drum.

Mathematics

. Use and read the scale on various types of torque wrenches.
. Use and read the brake drum gauge.
. Calculate the cost of replacing the brake drum assembly.

Science

. Explain the scientific principles involved when the brakes are applied.
. Explain the scientific principles involved in cooling the brake drum.

Activities of Unit

. Select tools and equipment for the job.
. Jack and support the automobile.
. Remove brake drum assembly as illustrated in automobile repair manual.
. Perform visual inspection of complete brake drum assembly.
. Note or replace all defective parts.
. Reassemble brake drum assembly as illustrated in automobile repair manual.
. Lower car and remove jack and safety stands.

Evaluation of Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written and oral examinations.

MECHANICAL OCCUPATIONS: METAL PROCESSING AND FABRICATION

Ceneral Description:

This cluster offers students the opportunity to extend their knowledge and skills in metal processing and fabrication. Individual instruction and problem solving activities in the areas of sheetmetal, heat treating, welding and machining will be characteristic of the type of experiences the students will have in this program.

Major Courses:

Technical Sketching and Interpretation
Metals Technology I
Metals Technology II (includes Cooperative Work Experiences)

Metal Processing and Fabrication

Objectives of Metal Processing and Fabrication

As a result of their learning experiences, students will be able to:

. Identify the various occupations within the metal processing and fabricating industry.

. Identify materials, tools, equipment, and processes used by the metal fabricating industries.

. Find, interpret, and apply technical and scientific information necessary for work in the metal fabrication industries.

. Use various hand tools, machines, and power equipment associated with the metal fabrication industries.

. Lay out and develop patterns and templates.

. Read and interpret blueprints.

. Perform necessary job task in the various occupational areas of the metal fabrication industries.

Basic Knowledge and Skills for Metal Processing and Fabrication
Units of Instruction

. Orientation
. Safety Rules and Hazards
. Types of Metals and Materials
. Hand and Power Tools (welding, sheetmetal, and machine shop)
. Types of Machines (welding, sheetmetal, and machine shop)
. Blueprint Reading
. Measuring and Laying Out Material
. Forming, Shaping, and Fabricating Sheetmetal
. Heat Treating Techniques
. Machine Shop Operations and Techniques
. Selection of Rod and Material
. Gas and Arc Welding Techniques
. Technical Related Information

With the learning experiences provided by the units of instruction as outlined on the previous page, students will be equipped and have the option to pursue further education and training in post-secondary programs or to enter any of the following occupations:*

Sheetmetal Helper (or Apprentice)
Machinist (Apprentice)
Gas Welder (Apprentice)
Arc Welder (Apprentice)
Foundry Coremakers Helper
Foundry Molders Helper
Structural Reinforcing Iron Worker (Apprentice)
Metal Patternmakers Helper
Tool Machine Shop Operators Helper
Tool and Die Maker (Apprentice)

Suggested Advisory Committee for Metal Processing Fabrication

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Business Representative
Tradesman
Interested Parent
Apprentice

Sample Unit of Instruction: Arc Welding

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

Arc Welding

. Properly connect the welding leads to the arc welding machine.
. Select the proper arc welding rod for the job.
. Set an arc welding machine to the desired heat range for welding.
. Properly strike an arc.
. Weld at least five different kinds of beads.

Language Arts

. List and spell correctly five basic weld forms.
. Write to a welding company for the characteristics of a welding rod.

Mathematics

. Calculate the size and percentage of weld penetration.
. Measure the size of weld beads.
. Describe the proper angles for the different welding positions.

*In the apprenticeable trades, entry level will be as an apprentice.

Science

- Describe in writing, the basic electrical differences between the alternating current (AC) and direct current (DC) arc welding machines.

- Explain the electrical principles involved in reverse and straight polarity.

Activities for Unit

- Care and use of arc welder
- Measurement and layout
- Grinding and cleaning
- Machine setting and adjustment
- Welding techniques
- Problem solving
- Welding basic bead patterns
- Testing of weldment

Evaluation of Sample Unit

- Instructor observations of student behavioral changes as stated in sample unit objectives.

- Student performance of activities completed.

- Written examinations.

TECHNICAL GRAPHICS OCCUPATIONS: TECHNICAL GRAPHICS

General Description:

This occupational area offers the students the opportunity to develop job skills in the area of Graphic Arts or Drafting. Experiences in the use of tools, equipment, and processes are pursued in depth. Students are also required to do independent work in relation to the occupational job tasks. Precise and high caliber work is demanded throughout the program.

Major Courses:

Option I

Graphic Arts Technology I
Graphic Arts Technology II (includes Cooperative Work Experiences)

Option II

Drafting Technology I
Drafting Technology II (includes Cooperative Work Experiences)

Graphic Arts Technology

Objectives of Graphic Arts Technology

As a result of their learning experiences, students will be able to:

. Perform necessary job tasks associated with the graphic arts industries.

. Identify materials, tools, equipment, and processes used in graphic arts work.

. Find, interpret, and apply technical and scientific information dealing with the graphic arts industries.

. Set up printing presses and layout work to be printed.

. Use of various graphic arts hardware necessary for composing of printed material.

Basic Knowledge and Skills for Graphic Arts Technology
Units of Instruction

. Small Offset Press Operations
. Large Offset Press Operations
. 2 and 4 Color Offset Press Operations
. Quality Control
. Paper, and Its Uses
. Safety Rules and Regulations

With the learning experiences provided by the units of instruction as outlined on the previous page, students will be equipped and have the option to further their education and training in post-secondary programs or to enter any of the following occupations:*

Lithographic pressman or helper
Relief printer or helper
Intaglio printer or helper
Stencil printer or helper
Photographer or helper
Bookbinder or helper

Suggested Advisory Committee for Graphic Arts Technology

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Former Student Employed by Industry
Tradesman
Printing Industry Representative
Interested Parent

Sample Unit of Instruction: Small Press Operations

Behavioral Objectives

As a result of their learning experiences, the students will be able to:

Graphic Arts

- Prepare a press for offset book paper.
- Prepare the press for a coated cover paper.
- Adjust and describe the maintenance of the offset blanket.
- Produce a heavy solid.
- Produce a fine line job.
- Select correct inks, driers and varnishes.
- Set paper for registration.
- Adjust ink and dampening rollers.
- Demonstrate paper preparation for press run.
- Adjust blanket and impression pressure.
- Identify lubrication points.
- Adjust feeder and blowers.
- Mix fountain solution.

Language Arts

- List words closely associated with Lithography.

*In the apprenticeable trades, entry level will be as an apprentice.

Mathematics

. Measure correct proportions of ink for the job.

Science

. Differentiate the characteristics of the different types of lubricants used on the press.

Activities

. Print school programs.
. Run school forms.
. Visit a commercial Lithographic Plant.
. Print school publications.
. Print posters and brochures.

Evaluation of Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

Drafting Technology

Objectives of Drafting Technology

As a result of their learning experiences, the students will be able to:

. Identify the various occupations within the Drafting field.

. Read and interpret sketches and blueprints.

. Identify and use the materials, tools, equipment, and processes used in drafting occupations.

. Perform necessary job tasks associated with the drafting occupations.

. Use the various reproducing machines.

. Interpret the various building and zoning codes.

Basic Knowledge and Skills for Drafting Occupations
Units of Instruction

. Orientation to Drafting Room Procedures
. Drafting Tools, Equipment, and Supplies
. Basic Drafting Techniques
. Sketching Techniques

. Orthographic Projection Techniques
. Pictorial Drawing Techniques
. Development Techniques
. Architectual Drawing Techniques
. Building and Zoning Codes
. Reproduction Techniques

With the learning experiences provided by the units of instruction as outlined above, the students will be equipped and have an option to pursue further education and training in post-secondary programs or to enter any of the following occuptions:*

Draftsman (or Apprentice)
Draftsman, Detail
Draftsman (electrical, mechanical, architectual, etc.)
Detailer
Layout Man and Checker
Die Designer

Suggested Advisory Committee for Drafting Technology

Administrator
Subject Teacher
Student Representative
Counselor
Union Representative
Industry Representative
Draftsman
Interested Parent

Sample Unit of Instruction: Basic Drafting Techniques

Behavioral Objectives of Unit

As a result of their learning experiences, students will be able to:

Drafting

. Fasten a sheet to the drawing board correctly.
. Select the correct pencil for different tasks.
. Sharpen the pencil correctly.
. Measure and draw horizontal lines correctly.
. Measure and draw vertical lines correctly.
. Measure and draw inclined lines correctly.
. Draw circles and arcs, using various instruments.
. Draw irregular curves.
. Know the alphabet of lines.
. Draw sheet margins, title blocks, and title strip correctly.

*In the apprenticeable trades, entry level will be as an apprentice.

Language Arts

. Define drafting terms related to the unit.
. Write a letter to a drafting company for a catalog of drafting instruments.

Mathematics

. Read and calculate various angles, using a protractor.
. Measure and read various circles with a divider.

Science

. Explain the composition of the lead used for different grades of pencils.

Activities of Unit

. Fasten and square a sheet on the drawing board.
. Select the proper drawing tools and equipment.
. Draw horizontal lines using the "T" square.
. Draw vertical lines using the "T" square, 30°-60° triangles.
. Draw inclined lines using the 30°-60° triangles.
. Draw arcs and circles with the dividers.
. Draw irregular curves using the french curves.
. Lay out a sheet with title block, margin, and title strip.

Evaluation of Unit

. Instructor observations of student behavioral changes as stated in sample unit objectives.

. Student performance of activities completed.

. Written examinations.

APPENDIX A

STANDARD EQUIPMENT AND TOOL LISTS

Office Education
Office Practice
Business Machines

STANDARD EQUIPMENT AND TOOL

Item		Approximate Unit Cost
Adding-Listing Machine, 10-Key	6	$225.00
Adding-Listing Machine, Full-Keyboard	1	134.00
Calculator, electronic	4	756.00
Calculator, printing	1	466.00
Calculator, Key-driven manual	2	325.00
Transcribing machine	2	487.00
Typewriter, electric, diff. spacing	2	525.00
Typewriter, electric, standard	8	420.00
Typewriter, elec., w/interchangeable type font	8	370.00
Stencil duplicator with cabinet	1	601.00
Spirit duplicator & copying machine combination	1	786.00
Mimeoscope	3	67.00
Styli and lettering guides	3 sets	54.00
Posting machine (optional)	1	
Billing machine (optional)	1	
Interval timer	1	27.00
Stop watch	1	18.00
Collating rack	1	26.00
Postal scale	1	11.50
Demonstration stand	1	52.00
Stapler, long arm, 16"	1	8.00
2-hole punch	1	3.00
3-hole punch	1	15.00
Paper cutter, 18" w/metal guide	1	26.00
4-drawer, metal file cabinet, legal with lock	1	129.00
Double-deck desk tray	3	4.00
Work organizer	2	7.50
Overhead projector and accessories	1	250.00
Tape recorder	3	125.00

BUSINESS OCCUPATIONS

Distributive Education

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
Adding machine, 10-key	6	$ 225.00
Adding machine, Full keyboard	1	134.00
Bow machine	1	95.00
Spirit duplicator	1	490.00
Demonstration stand	1	52.00
Typewriter, electric	3	420.00
Interval timer	1	27.00
Stop watch	1	18.00
Paper cutter	1	25.00
Stapler, long arm, 16"	1	20.00
2-hole punch	1	3.00
3-hole punch	1	14.50
Mirror alcove	1	150.00
Show case	2	225.00
Sales counter	1	200.00
Wrapping counter	1	130.00
Cash register	1	1,253.00
Produce scale	1	375.00
Overhead projector and accessories	1	250.00
Price marking machine	1	87.50
Mannequins, with stands	4	172.00
Mock merchandise	1 set	100.00
Wrapping paper holder and cutter	2	10.00
Magazine rack	2	30.00
Assorted tee stands (15 to a set)	1 set	31.60
File cabinet, 4-drawer, steel (legal size)	2	124.00
Double-deck desk trays	3	4.00
Bulletin card stand	1	33.75
Combination displayer (3 to a set)	1 set	46.50
Counter mirror	1	9.95
Gun tacker	1	13.00
Hollow half forms (6 to a set)	1 set	30.00
Postal scale	1	11.00
Record player	1	87.00
Tape recorder	1	120.00

BUSINESS OCCUPATIONS

Agricultural Technology

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
MAJOR EQUIPMENT		
Anvil, 70# and stand	1	$ 105.00
Bench, metal working	2	195.00
Bench, wood working	2	160.00
Drill, portable, 1/2"	1	85.00
Grinder, bench, 7"	1	80.00
Grinder, portable, electric, 110v	1	115.00
Hammer, electric, portable	1	90.00
Jack, hydraulic floor, 2T cap.	1	60.00
Merry Tiller, 5 hp.	2	375.00
Oxy-acetylene, welding and cutting	1	127.00
Refrigerator	1	500.00
Sander, disk, portable	1	80.00
Sander, belt, portable	1	115.00
Saw, portable, 7-1/4" complete	1	105.00
Saw, sabre, heavy duty	1	112.00
Scale, platform, 1,000#	1	120.00
Shear, portable, 10 gal, capacity	1	110.00
Sink, porcelain, dressing, stainless	1	250.00
Sprayer, power, complete, 50 gal.	1	375.00
Table, grading, stainless steel, 3'x10'	1	275.00
Tub, washing	2	75.00
MINOR TOOLS AND EQUIPMENT		
Auger, soil, 1-1/4 diameter, 40" long	1	11.00
Bar, wrecking	3	5.00
Bit, expansion, 7/8" - 2-1/2"	1	3.50
Bit, wood drill, 3/16" - 1/2" by 16ths	1 set	7.00
Bob, plumb, 10 oz., general	1	7.50
Brace, 8" and 10"	2	5.00
Chisel, wood working, various, 1/4"-1/2"	1 set	20.00
Chisel, cold, various	1 set	15.00
Clippers, bolt	1	25.00
Counter sink, 5/8", 3/4"	2	3.00
Cutter, pipe	1	18.00
Extension cord, 50 ft.	1	6.00
File, machinist, various	6	.75
Goggles, welding	6	2.25
Goggles, safety	6	1.75
Hammers, ball pein	6	3.75
Hammers, claw	6	3.75
Hammers, sledge, 8#	2	7.65
Hammers, welding	3	3.75
Hatchet, brood, 4-1/2" cut	2	5.00
Helmets, welding	6	8.00
Hoes, nursery	12	3.50
Knife, boning	3	3.00

STANDARD EQUIPMENT AND TOOL LIST

Agricultural Technology

(continued)

Item	Quantity	Approximate Unit Cost
Knife, butcher	3	$ 2.00
Knife, putty	2	1.50
Knife, sticking	2	2.00
Mallet, carpenters	1	3.50
Level, carpenter's, 24", aluminum	1	15.00
Pipe threader, ratchet, 5 sizes	1 set	75.00
Plane, jack, 14", 2" cutter	1	15.00
Plane, smoothing, 9", 2" cutter	1	12.00
Puller, nail	1	15.00
Pliers, cutting	2	2.00
Pliers, fence	2	3.60
Pliers, general use	6	2.75
Saw, compass	1	7.50
Saw, cross cut, 26", 8 pt.	3	15.00
Saw, hacksaw	2	7.50
Saw, rip, 26", 5 pt.	1	15.00
Screwdrivers, assorted	6	1.75
Screwdrivers, Philips, assorted	6	1.75
Snips, circular	1	3.50
Snips, tin	2	4.50
Respirators, chemical	3	8.65
Respirators, dust	6	2.75
Shovel, D-handle, short handle	6	5.50
Shovels, hollow bale, long handle	6	6.00
Sprayers, knapsack, 3 gal., capacity	4	56.00
Square, Try, 8"	2	2.50
Square, framing, 16" x 24"	2	7.50
Tap and die set	1 set	75.00
Tape, steel	1	15.00
Wheelbarrow	2	45.00
Wrenches, adjustable, 4", 6", 8", 10", 12"	1 set	16.00
Wrenches, allen	1 set	3.00
Wrenches, pipe, 12", 14", 16"	1 set	35.00
Wrenches, open end set	1 set	16.00
Wrench, vice grip, 7", 10"	1 set	16.00
Wrench, socket set, 1/2" drive	1 set	37.00
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Brooder, battery	1	160.00
Cage, 12 bird unit	5	50.00
Debeaker, electric, 110v	1	60.00
Feather picking machine	1	350.00
Heater, water, electric, 50 gal.	1	120.00
Refrigerator, walk-in, 6'x6'x8'	1	1,200.00
Tank, scalding, poultry	1	350.00
Tank, cold water, poultry	1	200.00

BUSINESS OCCUPATIONS

Agricultural Technology

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Chute, squeeze, portable	1	$ 800.00
Compressor, portable, gasoline, 32 gal. cap.	1	350.00
Post hole digger, portable, gasoline engine	1	350.00
Saw, chain, 16"	1	225.00
Trailer, animals	1	600.00
Welder, arc, complete with accessory	1	600.00
Husker, Macadamia complete	1	250.00

BUSINESS OCCUPATIONS

Ornamental Horticulture

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
MAJOR EQUIPMENT		
Autoclave	1	$359.00
Automatic watering system with time clock	1	300.00
Burner, weed, kerosene	1	65.00
Chemical proportioner	1	250.00
Germinator, portable, electric	1	50.00
Heater, water, 60 gal. capacity, 220 volt	1	120.00
Hedger, electric	1	75.00
Hot plate, 2 burner, electric	1	25.00
Ladder, folding, 8'	1	30.00
Lantern melter, alcohol	3	10.00
Magnifier, illuminated,	1	50.00
Meter, pH	1	200.00
Mold, bonsai pot, cast aluminum, various various sizes	1	200.00
Mold, pot, cast aluminum, 4"-6"-8"-10"-12"	1	200.00
Mower, green, manual, 9 blade	1	300.00
Mower, power, 21", reel	1	175.00
Shredder (compost machine)	1	300.00
Soil mixer, 1 cubic yard, 3 H.P., 110 volt	1	500.00
Soil sterilizer, 1 cu. yd. capacity	1	900.00
Sprayer, power, 20 gal., fiberglas lined	1	260.00
Sprayer, power mister, Knapsack	1	375.00
Sprayer, 2 gal., stainless steel with pressure indicator	1	50.00
Sprayer, Knapsack, stainless steel	1	75.00
Tiller, merry, complete with attachments	1	375.00
Wheelbarrow, construction type, rubber wheel	2	45.00
MINOR EQUIPMENT AND TOOLS		
Auger, soil, 3" diameter	1	19.00
Axes, standard, heavy duty	3	7.50
Brush cutter, Forrester, heavy duty	1	15.00
Caliper, tree	1	10.00
Can opener, heavy duty	1	15.00
Hammer, carpenter	3	7.50
Hoes, garden	10	6.00
Hose, garden, 50 feet	2	7.50
Pipe cutter and blades	1	25.00
Pipe threader and set	1	75.00
Pipe vise, portable	1	35.00
Pipe, die set	1	25.00
Pruner, heavy duty	3	7.00
Rake, floral	3	4.50
Rake, lawn	3	3.00
Respirator	6	3.50

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Saw, hand, 26", 8 point	1	$12.00
Saw, hand, 26" 10 point	1	12.00
Saw, pruning, 12", 14"	3	7.00
Saw, pruning, poled 12"	1	15.00
Shears, hedge, landscaping hand	2	12.00
Shears, pruning, heavy duty	6	12.00
Shears, lopping	2	10.00
Shovel, garden, long handle	3	7.00
Soil thermometer	1	6.00
Soil testing kit	1	30.00
Spade, solid shank	3	12.00
Sprinkler, Whirling	2	6.50
Tin snip	2	7.50
Trowel	6	3.50
Wax pot, grafting	3	3.00
Wire snip	2	7.50
Wrenches, pipe, assorted, 6"-8"-10"-12"	4	20.00
Grafting knives	12	4.50

PERSONAL/PUBLIC SERVICE OCCUPATIONS

Child Care Service

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
NURSERY SCHOOL FURNISHING & SUPPLIES		
Bookcase	1	$ 50.00
Bulletin board, peg board, or magnetic board	1	25.00
Cabinets for storage	1	380.00
Carpet (or area rugs), washable preferred, (omitted in lunch area). Vinyl floor covering may be used.	1	250.00
Chairs and tables for fifteen children		
Tables	4	55.00
Chairs	15	7.50
Chalkboard and screens	1	25.00
Child size book display rack	1	14.95
Childrens' books	50	2.00
Dishes, silver & trays for food service for 15 children		100.00
Drying racks for art work	3	4.00
Fixed easel	3	20.00
Food cart	1	25.00
Instructor's supplies: books, file cabinet, music, paper, paints, crayons, scissors		500.00
Mats for children's rest period	15	8.00
Medicine cabinet	1	25.00
Record player	1	40.00
Records	15	3.00
Shelving for toys	2	300.00
Wardrobe shelving or lockers (if H.E. tote trays are not available)	2	300.00
OUTDOOR PLAY EQUIPMENT		
Basketball	1	1.00
Buckets	4	1.75
Rakes	3	1.65
Shovel set	1	1.00
Simple outdoor play swings, etc., small size	1	250.00
Tricycles, varied sizes	4	15.00
Wagons	3	9.00
Watering cans	2	1.75
Wheelbarrows	2	3.50
INDOOR PLAY EQUIPMENT		
Baking set	1	2.00
Balls	1	2.00
Blocks and cart - different sizes & types		300.00
Brooms	2	.60
Chest of drawers	1	25.00
Construction toys (Tinker Toy type)	1	3.00

Child Care Service

STANDARD EQUIPMENT AND TOOL LIST (continued)

Item	Quantity	Approximate Unit Cost
Cooking pans	1	5.00
Cymbals	2	.78
Dish pan	1	.25
Doll bed	1	11.00
Dolls	3	10.00
Hammer	1	1.00
Hammer-Nail set	1	1.75
Hutch cupboard	1	29.00
Ironing board and iron	1	10.00
Jingles	3	.60
Play dishes and silverware	1	1.98
Pounding bench	1	3.00
Puzzles	8	1.50
Refrigerator	1	23.00
Rhythm sticks	6	.15
Saw	1	1.25
Sink	1	22.00
Snap-it-on building blocks	1	3.00
Stove	1	22.00
Tambourine	1	1.35
Telephones	2	1.00
Toy clock	1	5.00
Triangle musical instrument	1	1.50
Trucks, different sizes and types	6	15.00
Workbench and vise	1	38.00

STANDARD EQUIPMENT AND TOOL LIST

In addition to the regular Consumer and Homemaking Standard Equipment and Tool List, the following equipment and tools are recommended for the Food Service Program. Large commercial foods equipment is not included in the list. Demonstrations on use and care of larger equipment may be arranged through commercial equipment companies and/or the school cafeterias.

Item	Quantity	Approximate Unit Cost
LARGE EQUIPMENT		
Can opener (Institutional)	1	$ 14.00
Coffee maker and server, 3 burner (Institutional)	1	250.00
Coffee urn, 50 cups	1	30.00
Demonstration table, mobile	1	440.00
Electric slicing knife	1	22.00
Mixer, 5 qt. w/attachment (heavy duty)	1	250.00
Rice cooker, automatic, 25 cups	1	50.00
Scale, bakers, w/weights (Institutional)	1	75.00
Scale, portion	1	25.00
Timer	2	7.50
KITCHEN UTENSILS		
Cash box	1	5.25
Cutlery, steel	1	6.00
Cutting board	4	9.00
Dough cutter, 6" x 3" blade	4	3.00
Flour sieve, 14" metal sides	2	12.00
Knives		
French 12"	6	15.00
Boning 6"	4	5.25
Slicer 12"	4	10.00
Paring 3"	6	4.00
All-purpose 8"	6	7.00
Butcher 12"	2	5.25
Ladles - 1/3 pt., 6 oz., 4 oz.	2 ea.	1.50
Measurer, aluminum		
1/2 qt.	2	3.50
1 qt.	2	5.50
2 qt.	2	7.50
4 qt.	2	8.25
Mixing bowl set, 1½ qt., 2½ qt., 4 qt.	4 sets	10.00
Pastry bag w/tips	4	6.50
Pastry brush, round	4	2.25
Pastry brush, 1½"	4	1.25
Pastry brush, 3"	4	2.50
Ring mold, 5-6 cup	4	4.00
Scoops #8, 10, 12, 16, 24 and 40	2 ea.	3.98
Spring form cake pan	4	5.75

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
KITCHEN UTENSILS (continued)		
Thermometer		
Candy	2	2.50
Meat	2	4.50
All purpose	4	3.00
Whip, s.s., assorted #10, 12, 14	2 ea.	4.00
POTS AND PANS		
Double boiler, 5-1/2 qt.	2	17.00
Fry pan, 12" w/cover	4	11.00
Roaster, oval 18"	1	20.85
Roasting pan, 18 x 12 x 2	4	8.00
Sauce pan, long handle, flat bottom		
4-1/2 qt.	4	6.50
5-1/2 qt.	4	7.50
7 qt.	4	8.95
Stock pot w/cover, 5 gallon (Heavy duty)	2	16.00
DISHES, GLASSWARE, SILVER, ETC. (Place setting for 36, institutional type)		
Glassware		
Goblets	36	1.50
Sherbert	36	1.00
Juice glasses	36	.75
Beverage glasses	36	1.00
Linens		
Table cloth	6	6.00
Place mats	36	2.00
Napkins	36	1.50
Pitchers	6	4.00
Trays, round	6	4.00
Tray stand	3	25.00

CONSTRUCTION/CIVIL TECHNOLOGY OCCUPATIONS

Building Construction

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
EQUIPMENT		
Compressor, 60 gal. tank, 1-1/2 hp. w/belt guard and regulator	1	$756.00
Drill, portable, electric, 1/4" cap.	1	54.00
Drill, portable, electric, 1/2" cap.	1	95.00
Drill press, 15" floor	1	300.00
Grinder, 7" tool, 1725 RPM, w/sharpening attachment	1	265.00
Mitre box, w/26" saw	1	75.00
Router, portable, electric, 7/8 hp., w/access.	1 kit	150.00
Sander, 12" disc, w/blower	1	295.00
Sander, 6" x 48" belt, w/blower	1	440.00
Sander, portable, electric, belt, 3" x 24"	1	160.00
Sander, portable, electric, finishing	1	89.00
Saw, band, 20", 1 hp.	1	830.00
Saw, jig, 24"	1	290.00
Spray unit, w/cup and 25' hose	1 set	118.00
Torch, blow	1	24.00
Vise, machinist's, 3-1/2"	1	35.00
Vise, woodworking, 4" x 7", rapid action w/aluminum handle	32	24.00
TOOLS		
Awl, scratch, 6"	3	.95
Bar, wrecking, 36"	1	3.50
Bit, brace, ratchet, 10"	3	12.00
Bit, auger, #4 to #16 by 16ths	1 set	28.50
Bit, expansive, 7/8" to 3"	1 set	6.50
Bit, Forstner, 1/4", 3/8", 1/2"	1	8.50
Bits & chisels, mortiser, 1/4"	1 set	14.50
Bits & chisels, mortiser, 5/16"	1 set	14.50
Bits & chisels, mortiser, 3/8"	1 set	17.30
Bits & chisels, mortiser, 1/2"	1 set	18.25
Burnisher	2	2.50
Card file	6	.75
Caliper, inside and outside spring type, 8"	3 each	5.50
Chisel, wood, butt, 1/4", 3/8", 1/2", 3/4", 1"	2 each	10.50
Clamp, bar, 4', 5', 6' (set)	6 sets	23.00
Carving tool set, professional	1 set	30.00
Clamp, C, 3", 4", 5", 6", 8", 10"	6 sets	19.00
Countersink, rose, 1/2", 5/8"	1 each	1.10
Divider, wing, 8" and 10"	1 set	8.75
Dowelling jig	1	6.50
Drill, twist, straight shank, carbon, 1/16", 3/32", 1/8", 5/32", 3/16", 7/32"	6 each	18.00
Drill, twist, straight shank, cargon, 1/4", 5/16", 3/8", 7/16", 1/2"	3 each	16.05

Building Construction

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Drill, automatic	2	$ 5.50
Drill, hand, 1/4" capacity	2	8.33
Dresser, wheel, #0	1	3.65
File, auger bit, 7"	2	.60
File, flat mill, bastard cut, 10"	4	.95
File, half-round, double cut, bastard, 10"	2	1.20
File, square, double cut, bastard, 10"	2	.95
File, surform, #296, #295	2 each	6.50
File, slim taper, 7"	2	.85
Gauge, bit	2	1.20
Gauge, marking	2	.90
Glass cutter, turret head	1	.88
Handscrew, #0, 4" opening	12	3.50
Handscrew, #1, 6" opening	12	4.25
Handscrew, #2, 8" opening	12	4.65
Handscrew, #3, 10" opening	4	5.75
Hammer, claw, 16 oz.	12	3.75
Hammer, claw, 13 oz.	6	3.95
Hammer, upholsterer's magnetic, 7 oz.	1	3.25
Hammer, soft face, 16 oz.	2	3.05
Knife, draw	1	3.75
Knife, sloyd	4	.90
Knife, putty	3	.45
Level, 24", 30"	1 each	16.50
Mallet, hickory, 3" x 5"	6	1.10
Nail set, 1/32", 2/32", 3/32"	3 each	.38
Oilstone, crystolin, 2" x 7" x 1"	2	2.30
Oiler, 1/2 pt., 5"	3	1.05
Plane, block	6	6.25
Plane, smooth	6	9.35
Plane, jack	12	9.10
Plane, jointer	1	18.50
Plane, rabbit	1	2.60
Plane, router	1	9.40
Pliers, side cutting, 7"	1	3.25
Pliers, long nose, 6"	2	2.95
Pliers, combination, 6" and 8"	2 sets	4.25
Puller, nail	1	5.25
Rasp, wood, cabinet, smooth, 10"	6	2.10
Rasp, wood, cabinet, bastard, 10"	6	1.80
Respirator	2	4.50
Rule, push-pull, 8'	2	2.50
Rule, bench, steel, 1-1/4" x 12"	12	2.85
Rule, zig-zag, 6'	3	2.50
Saw, crosscut, 8 pt.	4	7.95
Saw, crosscut, 10 pt.	2	8.10
Saw, rip, 5-1/2 pt.	2	8.10
Saw, back, 15 pt., 12"	6	5.95

CONSTRUCTION/CIVIL TECHNOLOGY OCCUPATIONS

Building Construction

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Saw, coping	6	$ 1.25
Saw, compass, 12"	1	2.50
Saw, hack, 12"	1	3.05
Saw, keyhold, 10"	1	2.60
Scraper, cabinet, #80	4	3.85
Scraper, wood	4	1.20
Screwdriver, 2", 4", 6", 8"	4 sets	5.20
Screwdriver, Phillips, 3" and 4"	2 sets	2.90
Screwdriver, spiral, w/bits	1 set	4.50
Shield, face, 8"	6	4.40
Stone, slip, gouge	1	2.10
Spokeshave	3	1.45
Square, try, 8"	12	2.20
Square, framing, 24"	2	7.95
Snip, tin, 2-1/2" cut	1	3.95
Square, T-bevel, 8"	4	2.40
Turning tools	2 sets	38.50
Trammel points	1 pair	2.15
Wrench, crescent, 6" and 8"	2 sets	5.00
Wrench, combination open and box, 5/16" x 1"	1 set	48.00
Wrench, Allen	1 set	2.35
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Bandsaw	1	750.00
Drill, electric, portable	2	150.00
Dust collection system (if not built in)	1	10,000.00
Electronic wood welder	1	750.00
Hose, air, 25', 3516-1402, w/fittings	1	11.50
Jointer, 8"	1	635.00
Laminating press	1	400.00
Lathe, 14" wood	1	650.00
Mortiser	1	850.00
Plane, portable	1	165.00
Router, portable	1	85.00
Sander, 3" x 24", 4" x 27" belt, portable	2	160.00
Sander, 7" disc, portable	1	90.00
Sander, finishing, portable	2	80.00
Saw, all-purpose, portable	1	105.00
Saw, bayonet, portable	1	115.00
Saw, 6" and 7-1/4" circular, portable	1	80.00
Saw, panel, 2-way	1	365.00
Saw, radial, 12"	1	550.00
Saw, 12" table	1	600.00
Spray unit	1	118.00
Surfacer, 6" x 20"	1	1,500.00

STANDARD EQUIPMENT AND TOOL LIST

Building Construction

(continued)

Item	Quantity	Approximate Unit Cost
Uniplane	1	$ 150.00
Vacuum cleaner or blower system, complete w/fittings (if central dust collection system is not possible)	1	1,540.00
PLUMBING TOOLS		
Pipe vise	1	23.00
Pipe cutter	1	23.40
Pipe reamer	1	24.50
Pipe wrench, 10" and 12"	1 each	12.00
Tube cutter with reamer	1	
Asbestos gloves	2 pairs	7.95
Melting pot (small)	1	14.10
Ladle (small)	1	7.70
Conduit bender, 1/2"	1	7.15
ELECTRICIAN'S TOOLS		
Cable stripper	1	5.70
Electrician's knife	2	3.25
B & S Wire gauge	2	7.90
MASON'S TOOLS		
Funnel	1	.60
Tin snips	2	8.90
Brick chisel	2	2.05
Brick hammer	2	4.35
Mortar box or wheelbarrow	1	85.00
Mixing hoe	2	8.45
Shovel	2	5.72
Extension cord, 25'	2	4.05
Hawk (plaster's)	2	3.75
Caulking gun and tube	2	3.50
Step ladder	2	56.50
Sledge hammer	2	10.00
Finishing trowel	4	6.30
Brick trowel	4	6.00
Margin trowel	2	2.10
Pointing trowel	2	2.10
Redwood float	4	1.50
Bricklayer's jointer	2	1.40
Cement edger	2	2.20
Cement groover	2	4.20
Plasterer's apprentice tool kit (option)	1	69.00
Bricklayer's apprentice tool kit (option)	1	47.50

ELECTRICAL/ELECTRONICS OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Electrical and Electronics

Item	Quantity	Approximate Unit Cost
TESTING EQUIPMENT		
Vacuum tube voltmeter	8	$ 75.00
Peak to peak probe kit	1	7.30
R.F. probe kit	1	5.20
Audio generator (sine and square wave output)	1	75.00
Signal generator	4	75.00
Tube checker (transistor included)	4	115.45
Direct reading capacitor meter	1	41.95
Isolation transformer	2	8.39
Battery eliminator (10 amps continuous)	4	70.00
Multimeter with probes	8	75.00
Oscilloscope, 5"	1	150.00
Hydrometer	1	1.25
Speaker, 8" with cabinets	4	11.12
Microphone	1	12.95
Resistor decade box	1	26.20
Capacitor decade box	1	20.95
Headphone	8	5.00
GENERAL EQUIPMENT		
Generator, sweep/marker	1	200.00
Receiver, communication	1	319.51
Transmitter	1	440.55
(* 1 kit per 2 students)		
BENCH TOOLS (A set each for 8 benches)		
Pliers, 6" diagonal	8	2.90
Pliers, 6" long nose	8	2.24
Pliers, 8" side cutting	8	3.23
Pliers, 8" slip joint combination	8	1.62
Screwdriver, 3" and 6"	8 sets	1.50
Soldering iron, 125 watts	8	9.95
TOOLROOM TOOLS		
Alignment Tool kit	4	8.10
Awl, scratch	6	.83
Board, drawing, 18" x 24"	2	3.00
Bit, auger	1 set	22.50
Chisel, 1/2" cold	4	.50
Divider, wing, 8"	2	2.50
Drill, twist, 1 to 60 H.S.	1 set	8.00
Drill, twist, 1/16 to 1/2 H.S.	1 set	40.00
Drawing set	2	15.00
File card	4	.50
Files, 4" assorted needles	1 set	6.00

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
TOOLROOM TOOLS (continued)		
Gauge, wire, Starrett #282	1	$ 3.80
Gun, soldering, 125 watts	6	5.30
Hacksaw, 12"	2	2.04
Hammer, ball pein, 8 oz & 12 oz.	4 sets	2.75
Hammer, 16 oz., claw	1	3.75
Micrometer, 1"	1	19.00
Nippers, 12" cutting	1	3.64
Rule, 12" steel	4	1.85
Saw, rip, 7 pt., 26"	1	6.80
Saw, cross cut, 10 pt., 26"	1	6.80
Scale, architect's	2	.60
Screw plant, 4-36 to 1/4-20	1 set	37.50
Shield, face	2	3.00
Snip, aviation, cut left and cut right	2 sets	2.50
Square, 12" combination	1	3.50
Stone, combination oil	1	2.10
Stripper, wire	4	1.80
T-square, 24"	2	3.00
Triangle, 10", 30°/60° plastic	2	1.00
Triangle, 8", 45° plastic	2	1.00
Wrench, Allen	1 set	1.80
Wrench, adjustable, 4", 6", 8" 10"	1 set	8.50
SHOP EQUIPMENT		
Anvil, #50	1	70.00
Brake, 24" box and pan	1	400.00
Drill, 1/2" electric, portable	1	60.00
Drill, 1/4" electric, portable	2	35.00
Drill press, 12" bench	1	225.00
Grinder, 6" bench, w/eye shields	1	200.00
Shear, 36" squaring	1	450.00
Vise, drill press	1	45.00
Vise, machinist's, 3"	8	350.00
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
ELECTRICAL EQUIPMENT		
Demonstration Equipment	1 set	
Alternating Current Circuitry		280.00
Automotive Electricity		300.00
Chemistry & Electricity		165.00
Direct Current Circuitry		70.00
Electric Circuit		45.00
Electricity & Communications		290.00

ELECTRICAL/ELECTRONICS OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Electrical and Electronics

(continued)

Item	Quantity	Approximate Unit Cost
ELECTRICAL EQUIPMENT		
Demonstration Equipment (continued)		
Electricity & Magnetism		$ 145.00
House Wiring Circuits		120.00
Motors & Generators		350.00
Electrical Training Equipment (set/2 students)	12 each	650.00
Power Supply	12	80.00
Science Apparatus	1 set	
Electro Magnetism Demonstrator		65.00
Resonance Demonstrator		150.00
St. Louis Motor		20.00
Transformer Principles		100.00
ELECTRONIC EQUIPMENT		
Audio Signal Generator Sine/Square Wave Output	12 each	100.00
Digital Computer Trainer	1	1,200.00
Electronic Training Equipment w/Power Supply	12 each	775.00
Electronic Demonstration Unit	1 each	
Amplifiers		200.00
Basic Tube Circuits		160.00
Oscillator Circuits		200.00
Power Supply Circuits		98.00
Radio Receiver Circuits		250.00
Radio Transmitter Circuits		325.00
Reactance Network		130.00
Resistance in Electronics		110.00
Semi-Conductor Circuits		200.00
Television Circuits		410.00
Oscilloscope w/probe	12	250.00
Portable Tube, Transistor and Diode Tester	1	285.00
RF Signal Generator	12	75.00
VOM (FET)	12	90.00
VTVM (FET)	12	125.00
Television Analyst	1	419.00
Capacitor Analyst	1	125.00

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
MINOR SHOP EQUIPMENT (continued)		
Battery hydrometer	1	$ 1.50
Battery syringe & water container	1	10.50
Cord, extension, 50 ft., 14/3	4	8.50
Cover, fender	4	10.00
Drill, H.S. twist, fractional, 1/16" to 1/2"	1	45.00
Drill, H.S. twist, numbered, 0 to 80	1	38.85
Gauge, screw thread	2	4.15
Gauge, flat feeler	1	2.50
Gauge, wire feeler	1	1.85
Gauge, cylinder	1	4.50
Gauge, tire, automatic	2	12.50
Gauge, compression	1	8.50
Magnet, permanent bar & u-type	2	4.50
Oiler, hand pump	6	2.10
Piston ring remover and installer	6	3.50
Hose, air, 5/6 x 24', w/quick coupling	4	9.50
TESTING EQUIPMENT		
Tester, distributor (points, dwell, spark, coil, condenser, oscilloscope)	1	930.00
Tester, motor analyzer (battery, RPM, vacuum, etc.)	1	2,000.00
Tester, power timing light	1	45.00
Tester, generator regulator	1	60.00
Tester, battery-starter circuit	1	80.00
Tester, spark plug (cleaner & tester)	1	59.00
Valve refacer	1	995.00
Valve seat grinder	1	385.00
Valve spring compressor	1	23.00
Valve spring tension tester	1	48.00
Volt Ohm Meter	1	90.00
HAND TOOLS		
Caliper, 6", 1.0	1	3.95
Caliper, 6", 0.0	1	3.95
Chisel, 1/4" cape	4	3.85
Chisel, 1/2" cold	4	3.50
Chisel, 1/4" diamond	2	1.80
Divider, 6"	2	3.95
Goggle, safety (per student)	2	3.80
Hacksaw	4	3.50
Hammer, ball pein, 12 oz. & 16 oz.	4 sets	6.00
Hammer, 16 oz., claw	2	4.35
Hammer, soft face	4	4.85

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
HAND TOOLS (Continued)		
Pliers, 8" adjustable locking	4	$ 2.95
Pliers, 7" long-nose	4	3.15
Pliers, 6" & 8", combination, slip joint	6	16.50
Pliers, 7" diagonal cutter	4	3.50
Punch, 8" drive pin	4	1.10
Screwdriver, regular blade, 4", 6", 8" & 12"	5 sets	6.00
Screwdriver, stubby	1 set	2.35
Screwdriver, offset	1 set	4.10
Screwdriver, Phillips, #1, #2, #3, #4	1 set	2.90
Screw extractor (set of 6)	1 set	5.30
Scriber, 10" double point	4	1.95
Shield, face	6	6.50
Snip, aviation	1	4.80
Snip, tin, straight	2	6.85
Snip, curved	2	7.50
Soldering iron, 225 watt	2	16.50
Soldering gun, 150 to 250 watt	1	15.50
Square, 12" combination	2	16.50
Tap and die, machine screw, NC & NF, #6 to #12	1 set	75.00
Tap and die, National Stand, NC & NF, 1/4" to 1"	1 set	350.00
Tap and die, National Stand., pipe, 1/8" to 3/8"	1 set	50.00
Tape, 25' steel	1	6.50
Wrench, box, double offset, 3/16" to 1"	2 sets	32.50
Wrench, deep socket, 1/2" drive, 9/16" to 1"	2 sets	14.50
Wrench, drive adapter, 3/8" female & 1/2" male	2 sets	1.50
Wrench, elect., open double end, 13/64" to 3/8"	4 sets	10.00
Wrench, elect., socket, 13/64" to 3/8"	2 sets	6.80
Wrench, handle, 3/8" & 1/2" socket drive	2 sets	18.50
Wrench, handle, 3/8" & 1/2" flexible drive	2 sets	7.50
Wrench, handle, 3/8" & 1/2" speed drive	4 sets	6.50
Wrench, monkey, 10"	2	4.50
Wrench, open end, 3/16" to 1"	2 sets	14.50
Wrench, pipe, 10"	1	2.65
Wrench, socket, 3/8" drive, 3/8" to 3/4"	2 sets	8.95
Wrench, socket, 1/2" drive, 7/16" to 1-1/4"	2 sets	16.95
Wrench, tappet adjusting, 7/16" & 1/2"	2 sets	5.10
Wrench, torque, 3/8" drive, 0-25 ft./lb.	2	27.95
Wrench, torque, 1/2" drive, 0-150 ft./lb.	2	38.75
Wrench, universal joint, 3/8" & 1/2" drive	1	4.50
Wrench, vise-grip	3	2.45
Wrench, comb. 3/8" - 3/4"	3 sets	14.50
Wrench, socket, 1/4" drive	1 set	14.95
AUTOMOTIVE COMPONENTS & EDUCATIONAL UNITS		
Brake assembly, front and rear	1	25.00
Carburetor, current model	5	15.00

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
AUTOMOTIVE COMPONENTS & EDUCATIONAL UNIT (cont.)		
Chassis, passenger car	1	$ 35.00
Cylinder head	1	8.00
Differential carrier assemblies, conventional	2	35.00
Distributor, current model	2	40.00
Engine, 6-cylinder, overhead valve	1	80.00
Engine, 6-cylinder, L-head	1	80.00
Engine, 8-cylinder, V-type	1	80.00
Engine, cut-away	1	80.00
Fuel pump, current model	2	6.50
Generator, D.C., 6 and 12 volts	1	15.00
Generator, A.C., high output self-rectified	1	35.00
Ignition coil, current model	2	8.50
Ignition condenser, current model	2	5.00
Regulator	2	7.50
Starting motor	2	30.00
Steering gear assembly, convention & power	1	35.00
Transmission assembly, conventional, overdrive and automatic	1 each	45.00
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Air sander, disc	3	85.00
Air sander, orbital	3	75.00
Automotive tools panels	1 set	1,500.00
Battery charger	1	150.00
Clutch coupling	1	150.00
Diesel engine	1	450.00
Differential gear	1	135.00
Distributor tester	1	825.00
Drill, 3/8" portable	2	120.00
Engine stand, universal	3	200.00
Four-stroke engine	1	95.00
Four-stroke diesel engine	1	125.00
Fuel cell test unit	1	100.00
Hydraulic disc brake	1	250.00
Ignition simulator	1	250.00
Model chassis w/glass motor	1	650.00
Motor dynamometer	1	800.00
Refrigeration & air-conditioning training units (basic unit/test equipment)	1	1,750.00
Service jack	2	200.00
Small engine	6	60.00
Small engine dynamometer	1	400.00
Solar cell test unit	1	100.00
Standard transmission	1	185.00
Starter battery	1	65.00
Steam cleaner	1	550.00

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Steam engine	1	$ 125.00
Steering	1	125.00
Thermo-electric generator	1	280.00
Two-stroke engine	1	80.00
Valve refacer	1	650.00
Valve seat grinder	1	280.00
Wankel motor	1	185.00
Wet and dry vacuum unit	1	150.00
Wheel balancing equipment (Dynamic)	1	700.00
Automotive spray booth unit (if not built in)	1	5,600.00
Tire changer (air/electric)	1	600.00
Wheel alignment	1	2,400.00

MECHANICAL OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Metal Processing and Fabrication

Item	Quantity	Approximate Unit Cost
MACHINE SHOP EQUIPMENT		
Arbor press, 3-ton	1	$ 170.00
Compressor, air, 3 hp.	1	750.00
Drill press, bench, 10"	1	300.00
Drill press, 17" floor model, #3M.T.	1	265.00
Lathe, 9" metal, compl. w/accessories	2	1,500.00
Lathe, 10" metal, compl. w/accessories	1	2,800.00
Power hacksaw, 4" to 6"	1	525.00
Vertical mill, compl. w/accessories	1	1,500.00
Vise, machinist's 3½" swivel	12	65.00
Vise, machinist's 4" swivel	4	82.00
Vise, drill press, 4" to 6"	1	68.00
Grinder, 8" pedestal, w/shields	1	300.00
SHEETMETAL EQUIPMENT		
Bench plate	2	85.00
Bender, 6" radius cap., 1/2"	1	465.00
Brake, box and pan, 24" or 36"	1	550.00
Former, 36" slip roll	1	295.00
Rivet gun	2	32.00
Rotary combination machine w/accessories	1	125.00
Rotary machine, universal, w/accessories	1	157.00
Shear, 36" squaring	1	550.00
Spot welder (resistance)	1	750.00
Spray gun, compl. w/hose & regulator	1 set	150.00
Stake, beakhorn	1	95.00
Stake, blowhorn	1	50.00
Stake, candle mold	1	48.00
Stake, creasing	1	72.00
Stake, conductor	1	54.00
Stake, double seaming	1	68.00
Stake, hollow mandrel, 48"	1	80.00
Stake, squaring	1	37.00
Folder, bar, 30" Pexto #63		375.00
WELDING EQUIPMENT		
Arc welder, AC/DC, 180-200 amp., compl.w/access.	1	425.00
Clamp, C, heavy-duty, 6"	6	2.80
Cleaning tool, welder's	2	1.50
Gas welding unit, oxy-acetylene, compl. w/accessories & cart	2 sets	550.00
Goggles, welder's, w/lenses	6	4.00
Helmet, welding	4	15.00
Spring clamp, 2"	6	.75
Tip cleaner	2 sets	2.00
Torch lighter, w/flints	2	1.40

MECHANICAL OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Metal Processing and Fabrication

(continued)

Item	Quantity	Approximate Unit Cost
FORGING AND WROUGHT IRON EQUIPMENT		
Anvil, 70 lb.	2	$ 65.00
Furnace, combination gas	2	52.00
Furnace, heat treating	1	75.00
Tongs, curved	1	6.40
Tongs, flat	1	6.85
Tongs, pick-up	1	6.95
ART METAL EQUIPMENT		
Anvil, round and square head	1	35.00
Buffing machine	1	90.00
Chisels, assorted	1 set	18.00
Hammers, assorted	1 set	32.00
Lathe, metal spinning, compl. w/accessories	1	335.00
Mallets, assorted	1 set	20.00
Saw, jeweler's	2	2.40
PLANNING AND DESIGNING EQUIPMENT		
Board, drawing, 18" x 24"	5	4.00
Compass, bow, 6"	5	4.10
Divider, 6"	5	4.10
T-square, 24"	5	4.10
Triangle, 45°, 8"	5	1.25
Triangle, 30°/60°, 10"	5	1.25
HAND TOOLS		
Awl, scratch	8	1.15
Bar, crow	1	3.00
Brush, wire	5	.90
Caliper, outside, 8" & 4"	2 sets	9.50
Caliper, inside, 8" & 4"	2 sets	9.00
Caliper, micrometer, outside, 1"	2	25.00
Caliper, micrometer, outside, 2"	1	32.00
Caliper, micrometer, outside, 2" - 3"	1	70.00
Caliper, micrometer, inside, 2" - 4"	1	68.00
Card, file or wire brush	4	.95
Chisel, cape, 5/16"	1	.95
Chisel, cold, 1/4", 3/4", & 1/2"	4 sets	2.50
Chisel, cold, 5/8" & 3/4"	2 sets	2.50
Chisel, diamond point, 1/4"	1	.92
Clamp, handy, #3	2	2.95
Clamp, C, 3", 6" & 8"	4 sets	8.50
Clipper, bolt, 36"	1	35.00
Cutter, glass	1	1.10
Dies, pipe, 1/8" to 3/4"	1 set	75.00

MECHANICAL OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Metal Processing and Fabrication

(continued)

Item	Quantity	Approximate Unit Cost
Divider, spring joint, 6" or 8"	2	$ 6.40
Divider, spring joint, 4"	1	5.10
Drill, portable, electric, 1/4" cap.	1	54.00
Drill, portable, electric, 3/8" cap.	1	75.00
Drill, portable, electric, 1/2" cap.	1	95.00
Drill, hand	2	6.95
Drill, masonry, 1/4", 3/8", 1/2"	1 set	6.00
Drill, twist, 1/16" to 1/2" H.S.	2 sets	45.00
Drill, twist, #1 to #60 H.S.	1 set	27.50
Drill, combination countersink	1 set	11.15
Dresser, grinding wheel	1	3.00
File, flat, bastard, 10" and 12"	2 sets	2.50
File, flat, second cut, 8" and 10"	2 sets	1.75
File, flat, smooth, 10" and 12"	6 sets	2.30
File, flat, half-round, bastard, 8"	2	.85
File, flat, half-round, second cut, 8"	2	.95
File, flat, mill-smooth, 10"	2	.85
File, flat, round, bastard, 8"	2	.65
File, flat, round, smooth, 8"	2	.75
File, slim taper, 6"	2	.50
File, square, bastard, 8"	2	.75
Gage, center	3	4.20
Gage, screw pitch	1	3.20
Gage, surface	1	7.95
Gage, thickness	1	3.35
Gage, tap and drill	1	8.50
Gage, wire	1	6.40
Grinder, disc, portable, electric, 7"	1	120.00
Groover, hand, #2, #4	1	4.40
Hacksaw, frame, 10"-12"	6	3.50
Hammer, ball pein, 8 oz., 12 oz., 16 oz.	4 sets	8.10
Hammer, ball pein, 20 oz.	1	3.15
Hammer, cross pein, 16 oz.	1	3.75
Hammer, blacksmith, 2-1/2 lbs.	1	3.30
Hammer, soft face, 16 oz.	1	2.75
Hammer, rivetting	4	3.15
Hammer, setting	4	3.50
Hammer, sledge, 3-4 lbs.	1	4.75
Jigsaw, portable, electric	1	110.00
Letter, steel, and figures, 1/4" (each)	1 set	18.50
Mallet, hickory, 3" face	2	.95
Mallet, rawhide or rubber	2	2.45
Oiler, 1/2 pt., 4" spout	4	.75
Oiler, squirt	2	.75
Pliers, combination, 8" and 10"	2 sets	3.80
Pliers, diagnol, 7"	2	2.50
Pliers, side cutting, 7"	2	2.75
Pliers, needle nose, 6"	2	2.40

MECHANICAL OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Metal Processing and Fabrication

(continued)

Item	Quantity	Approximate Unit Cost
Punch, center, 3/8" and 1/2"	4	$ 4.75
Punch, prick, 3/8" and 1/2"	3	2.95
Punch, taper, 3/32" x 1/4"	1	6.75
Punch, pin, 1/8" and 5/16"	1	4.15
Punch, hollow, 1/2" and 3/4"	1	9.65
Reamer, pipe	1	24.50
Reamers, hand, 1/4" to 3/4"	1 set	2.50
Rivet set, #3, #4, #5, #6	1	4.95
Rule, steel, 12"	12	3.45
Rule, narrow steel	3	2.10
Rule, circumference, 48"	1	8.95
Respirator	1	4.50
Screwdriver, 1", 4", 6", 10"	2 sets	4.75
Screwdriver, stubby	1	1.65
Screwdriver, offset	1	.95
Screwdriver, Phillips #1 to #4	1 set	2.50
Screw plate, NC & NF, #1 to #12	1 set	65.20
Seamer, tinner's, handy	2	5.95
Soldering copper, 1 lb.	3	1.35
Soldering iron, electric, 1/2" tip	3	8.45
Soldering iron, electric, 7/8" tip	1	12.50
Snips, tin, curved	1 pair	7.45
Snips, hawk bill	1 pair	8.50
Snips, compound	1 pair	4.10
Snips, tin, 12-1/2"	4 pairs	3.64
Snips, aviation M-1, M-2, M-3	1	3.75
Square, combination, 12" blade	3	2.05
Square, framing, 24"	2	4.65
Square, T-bevel, 6"	2	2.80
Tap and die, N.C. 1/4" to 1"	1 set	160.00
Tap and die, N.F. 1/4" to 1"	1 set	160.00
Torch, blow or propane	1	6.95
Vise, pipe, 1/8" - 2-1/2"	1	16.50
Vise grips	4	3.85
Wrench, Allen	1 set	2.65
Wrench, crescent, 6", 8", 10" 12"	2 sets	12.00
Wrench, box end, 1/4" - 1-1/4"	1 set	45.60
Wrench, open end, 1/4" - 1-1/4"	1 set	28.75
Wrench, pipe, 10", 12", 14"	1 set	14.75
Wrench, socket, 1/4" to 1"	1 set	32.50
Wrench, monkey, 12"	1	3.95
Bandsaw, metal cutting, 14		435.00
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Bend tester	1	140.00
Cut-off shears	1	90.00

MECHANICAL OCCUPATIONS

STANDARD EQUIPMENT AND TOOL LIST

Metal Processing and Fabrication

(continued)

Item	Quantity	Approximate Unit Cost
Electric welder, 300 Amp AC/DC	1	$ 550.00
Gas welding unit (4 stations) (additional units needed)	2 sets	550.00
Geared head metal lathe, 13"	2	3,500.00
Hand tools (additional needed)	1 set	1,200.00
Hardness tester	1	600.00
Metal bender	1	450.00
Metal cutting bandsaw	1	950.00
Notcher	1	350.00
Portable nibblers	1	160.00
Portable shears	1	135.00
Tig welder, AC/DC	1	1,500.00
Turret punch press	1	1,050.00
Universal Brake, 48"	1	700.00

TECHNICAL GRAPHICS OCCUPATIONS

Graphic Arts Technology

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
BOOK BINDING UNIT EQUIPMENT		
Bench, work, 24" x 48"	1	$ 250.00
Board, sewing frame, w/upright & cross bar	1	25.00
Cutter, paper, 30" to 36"	1	1,585.00
Cutter, board, 30" to 36"	1	700.00
Drill, hand	1	12.00
Drill, paper, 1/4 hp.	1	157.00
Folder	1	560.31
Folder, bone (per student)	1	1.00
Hammer, backing	1	6.00
Knife, bending (per student)	1	2.00
Perforator	1	14.00
Pot, steel, dechic, 1 qt., w/brush, 1"	1	31.60
Press, backing	1	1,500.00
Press, bold stamping	1	600.00
Press, standing	1	375.00
Ruler, steel, 12" (per student)	1	3.30
Scissors, 8" to 10" (per student)	1	1.80
Square, steel, 12" x 7"	1	4.00
Stitcher, wire, 1/2 foot operated	1	131.00
SILK SCREEN UNIT EQUIPMENT		
Frame, printing, 12" x 18", #12 silk	2	20.00
Frame, printing, 9" x 12", #12 silk	2	18.00
Squeegee, 8" & 11"	2	10.00
LETTERPRESS UNIT EQUIPMENT		
Cabinet, roller and ink	1	465.00
Cabinet, type, w/double-tier working top:		
24 California job case each	4	849.00
Gage, line, 12" 614	12	2.35
Galley, steel, 8-3/4" x 13"	30	1.07
Knife, ink, square ends, 8"	4	3.05
Mallet, printer's, hickory, medium	1	3.85
Mitering machine, hand operated	1	107.80
Planer, proof, 3-1/4" x 8", leather top	1	2.45
Press, platen, 8" x 12", w/rollers	1	1,934.00
Press, platen, 10" x 15", w/rollers	1	2,334.00
Press, proof, 16" x 21"	1	460.00
Quoins, 4-1/2"	24	4.35
Quoin key, T-head	4	3.50
Stick, composing, 6" x 2", ss	12 sets	10.15
Stick, composing, 10" x 2"	2	12.55
Table, imposing, 51" x 39", w/storage space for galley, chases and furniture	1	860.00
Table makeready, 32" x 17", tilt top	1	250.00

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
TYPE AND SPACING MATERIAL EQUIPMENT		
Font, Modern Gothic, 6 to 30 points	1	$ 139.00
Font, Standard Text, 10 to 36 points	1	117.00
Font, Modern Script, 14 & 18 points	1	48.00
Font, miscellaneous boarders, decoration and initials	1	150.00
Furniture, assorted	1 set	106.00
Lead, 2 points	100 lbs.	70.00
Rule, 2 points size w/1/4" point face	1	.65 lb.
Rule, 2 points size w/1" point face	1	.65 lb.
Slug, 6 points	100 lbs.	70.00
Spaces, assorted, for every size type	100 lbs.	37.00
Type face, standard, complete family, 60 to 30 points	1 font ea.	115.00
OFFSET UNIT EQUIPMENT		
Box, print, 7" x 9"	1	65.00
Camera, 24" x 24", complete lens and copy holder	1	2,400.00
Drafting equipment, complete	1 set	11.50
Frame, vacuum print, 20" x 23"	1	275.00
Enlarger	1	175.00
Lamp, carbon arc, 35 amp.	2	300.00
Lamp, carbon car, single unit	1	300.00
Press, offset printing	1	3,600.00
Refrigerator, electric, 5 to 7 cu. ft.	1	25.00
Sink, film developing, 3 compartments	1	1,200.00
Sink, place developing	1	600.00
Table, layout, 32" x 42"	1	300.00
Table, utility (for stripping, opaquing, etc.)	1	300.00
Table, drafting	1	106.50
Timer, clock, darkroom	1	28.00
TOOLS		
Can, benzine, pint	3	4.75
Can, benzine, 5 gallons	1	11.50
Can, oil	1	2.50
Can, waste	1	5.50
Gun, grease	1	6.50
Hammer, ball pein, 12 oz.	1	2.20
Hammer, claw, 16 oz.	1	3.80
Hammer, soft face, 13 oz.	1	2.29
Pliers, combination, 8"	1	1.81
Pliers, long-nose, 7"	1	2.20
Saw, 8 or 10 pt.	1	6.80
Screwdriver, 4", 6", 8"	1	5.60

TECHNICAL GRAPHICS OCCUPATIONS

Graphic Arts Technology

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Screwdriver, Phillips, #1, #2, #3	1	$ 2.11
Snip, tin, combination	1	4.20
Wrench, socket, 1/4" to 1"	1 set	22.75
Wrench, open end, 1/4" to 1"	1 set	2.53
Wrench, socket, Allen	1 set	1.09
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR		
ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Airbrush	1	45.00
Binding Unit, plastics	1	248.00
Camera, copying	1	7,000.00
Camera, reflex, twin lens	2	150.00
Cutter, lead and slug	1	63.00
Cutter, round corner	1	45.75
Densitometer, photo	1	1,200.00
Drill, electric, portable, 1/4"	1	45.00
Dryer, print	1	227.00
Duplicating machine, stencil	1	430.00
Duplicating machine, spirit	1	250.00
Filter, photo (set)	1	2.50
Folding machine (office)	1	400.00
Hot plate, electric	1	32.50
Imposing stone table	1	935.00
Jogger, paper	1	750.00
Meter, light	1	35.00
Mitering machine	1	95.00
Numbering machine, cleaner box	1	34.00
Numbering machine, hand	1	15.75
Number machine, press	2	25.00
Perforator	1	1,200.00
Planer, type	4	10.00
Plate-maker	1	1,500.00
Press, copying	1	97.00
Press, hot stamping	1	7,500.00
Press, offset (17" x 22")	1	17,000.00
Press, padding	1	25.00
Press, platen, automatic feed	1	4,000.00
Press proof, reproduction	1	2,000.00
Press, rubber stamp	1	224.50
Printer, contact	1	50.00
Printmaker, graphic arts	1	700.50
Punch, paper	1	31.50
Quoin, Hi-speed	48	9.20
Quoin key, Hi-speed	4	6.95
Sink, platemaking	1	320.00
Stapler, saddle or side	1	1,200.00
Glue pot	1	25.45

TECHNICAL GRAPHICS OCCUPATIONS

Graphic Arts Technology

STANDARD EQUIPMENT AND TOOL LIST

(continued)

Item	Quantity	Approximate Unit Cost
Tanks, film development	5	$ 25.00
Thermometer, photographic	2	2.50
Timer, photographic, electric	2	25.00
Timer, photographic, spring wound	2	15.00
Tray, photographic	12	10.00
Trimmer, paper	1	129.00
Truck, bindery	1	250.00
Type, assorted		2,500.00
Typesetter, photoheadsetter	1	500.00
Typewriter, electric	1	385.00

TECHNICAL GRAPHICS OCCUPATIONS

Drafting Technology

STANDARD EQUIPMENT AND TOOL LIST

Item	Quantity	Approximate Unit Cost
INSTRUMENTS & TOOLS		
Blackboard set	1	$ 9.50
Board, drawing, 18" x 24" (per student)	200	2.95
Caliper, 6" inside and outside	2 sets	4.60
Caliper, vernier	1	11.00
Caliper, micrometer	1	19.00
Chalkboard machine	1	250.00
Compass, 6-1/2"	30	3.70
Compass, 4-1/2" bow	30	3.48
Compass, 9" to 12" beam	1	9.00
Cutter, paper, 24"	1	45.00
Curve, French	1 set	20.00
Dust brushes	30	.76
Drafting machine, 16"	4	65.00
Lettering set	1	60.00
Mobile parallel ruling units	2	25.00
Pencil sharpener, draftsman's	1	6.60
Protractor, circular	2	2.00
Reproduction Machine, comb. printer/developer	1	800.00
Scale, architectual triangular, 12"	30	2.00
Scale, engineer's, 12"	2	1.00
Shears, trimming, 14"	1	10.50
Triangle, 10", 30°/60°	30	.56
Triangle, 8", 45°/90°	30	.56
T-square, 24"	30	2.95
Board, drawing, 23" x 31"	30	5.50
Divider, 6", F328	30	3.70
Demonstration scale, #2332	1	8.75
T-square, 30"	1	5.50
SPECIAL TOOLS AND EQUIPMENT NEEDED FOR		
ADDITIONAL SPECIFIC OCCUPATIONAL EXPERIENCES		
Chalkboard drafting machine	1	350.00
Drafting machine, 16" and 18"	12	82.00
Drawing board with parallel ruling, straight edge	12	25.00
Lettering equipment	3	120.00
Multi-student drafting table (10-drawer unit, 2 wings)	12	350.00
Overhead projector, screen and portable stand	1 unit	250.00
Perspective drawing board	6	35.00
Transparencies	1 set	250.00

APPENDIX B

SAMPLE SCHOOL PLANS OF ACTION FOR

IMPLEMENTING THE PRE-INDUSTRIAL PREPARATION PROGRAM

Although most of the sample plans included here are for the first year the program was to be implemented in the particular school, such specific planning for every year of operation is recommended.

AIEA HIGH SCHOOL

PLAN OF ACTION FOR THE PRE-INDUSTRIAL PREPARATION PROGRAM (1972-1973)

A. Programs for 1972-1973

1. Electrical Technology
2. Graphic Arts Technology
3. Related Areas: English
   Math/Science

B. Criteria for Selection of Students

1. SCAT-STEP scores
2. Interviews
3. Student interest
4. Teacher recommendation

C. Evaluation

1. California Test of Basic Skills

   Pre-test - September 15, 1972
   Post-test - May 15, 1973

2. Evaluation by students and staff

D. Selection of Personnel

1. English Instructor
2. Math/Science Instructor
3. Electrical Instructor
4. Graphic Arts Instructor
5. Counselor

E. Advisory Council to Assist Staff

1. Union Representative
2. Industry (i.e., employers)
3. Faculty Members
4. Parents
5. Registrar

F. Supplies and Equipment Lists

To be completed by April, 1972, pending availability of funds.

G. Facilities

Renovation estimates by September 15, 1971, for:

Rooms C-3 and 4
Rooms S-6 and 7

H. Registration for Pre-Industrial Preparation Classes

To be completed by:

95% enrollment by May, 1972
5% enrollment by September, 1972

I. Orientation: 1971-1972

1. General Faculty Meeting (staff)
2. Parents' Night (parents)
3. Pre-Registration Course of Study (students)

J. School Visitations

1. Kaimuki High School
2. Farrington High School
3. Waianae High School
4. Lahainaluna High School

IMPLEMENTATION TIME LINE
1971-1972

Orientation of staff to the Pre-Industrial Preparation Program	-	September
Check out facilities	-	September
Organizational meeting for the Pre-Industrial Preparation team	-	October
Orientation of parents to the Pre-Industrial Preparation program	-	November
Pre-registration	-	January
Complete identification of students in program	-	January
School visitation	-	February
Registration of students completed	-	March
Complete: Instructional materials evaluation supply and equipment orders	-	April
Staff selection for program completed	-	May

FARRINGTON HIGH SCHOOL

PLAN OF ACTION FOR PRE-INDUSTRIAL PREPARATION PROGRAM

A. Programs Offered in 1970-1971

1. Power and Automotive Technology
2. Building Construction
3. Graphic Arts Technology
4. Cooperative Industrial Education
5. Foods Service
6. Cooperative Food Service Education
7. Related Areas: English, Math-Science

B. Student Selection

Target dates: 95% enrollment by October, 1970
Other 5% will be enrolled through 1st semester

Math area: 50% by September 1, 1970
100% by October 1, 1970

C. Testing

CTBS -- Pretest by September 15, 1970
Posttest by May 15, 1971

D. Class Schedules

Distribution in August for students who pre-registered

E. Instructor Selection

Completed

F. Orientation of Staff

August 28: New English teacher
New Math teacher
New Counselor
Mr. Minami
Coordinator

G. Facility Preparation

All teachers have rooms assigned.

H. Textbook Selection

PIP classes: textbooks, reference material, etc. ordered
Related areas: need to place in order
Evaluation of textbooks, reference material, etc.:

English-Math by October 1
Industrial-Technical classes by November 1

FARRINGTON HIGH SCHOOL

I. Ordering Supplies

To follow State guide

J. Capital Improvement

Review with Vice Principal in charge of business by December 1

K. Program Evaluation

1. Counselor will administer CTBS in September and in May.

2. Follow-up study of graduates by counselor with the help of the PIP staff.

HILO HIGH SCHOOL

PLAN OF ACTION FOR PRE-INDUSTRIAL PREPARATION PROGRAM (1970-1971)

A. Personnel

1. Administrator
2. Counselor
3. Building Construction Technology Instructor
4. Power and Auto Mechanics Instructor
5. Math/Science Instructor
6. Language Arts Instructor

B. Student Selection

1. Students selected for auto mechanics and building construction. (Registration done prior to implementation of program.)

2. Grades 11 and 12 students

3. High interest in areas but underachievers in classes

C. General Goals of the Pre-Industrial Preparation Program

1. Educate the "whole" student and not just emphasize the skills.
2. Take students from point they are at and individualize instruction.
3. Improve students' skills, attitudes, and behavior.

D. Pre-Planned Time Schedule (1970-71)

August 3 - 14	Advisory Council Selection
August 24 - 28	Hilo PIP workshop -- Curriculum Development
September 2	PIP team members meeting
September 7	School faculty orientation
September 7 - 11	Pre-testing
October 7	Meeting, PIP team members
November 4	Meeting, PIP team members
December 2	Meeting, PIP team members
December 7	Meeting, Press release on PIP Program
January 6	Meeting, PIP team members
January 9	Meet with Konawaena PIP team members at Kona for analysis of program and long-range project direction
February 3	Meeting, PIP team members

Pre-Planned Time Schedule (1970-71)

February 1 - 12	Selection of instructor (program expansion)
February 15 - 26	Staff orientation (program expansion)
February 15 - 26	Facility preparation (program expansion)
February 15 - 26	Textbook, supplies and equipment selection
March 3	Meeting, PIP team members
March 1 - 19	Student selection (counseling)
March 15	Preliminary budget
March 22 - 26	Registration of selected students
April 7	Meeting, PIP team members
April 12 - 16	Pretest for new students for following year
April 30	Submit budget
May 5	Meeting, PIP team members
May 3 - 14	Post-testing
May 17 - 28	Evaluation of program -- meeting with Konawaena at Hilo

E. Miscellaneous

Meeting -- 1st Wednesday of every month

Agenda

a. Evaluation
b. Planning
c. Reporting
d. Follow-up -- Counselor makes annual report
e. Placement -- Counselor (supported by team)

KAPAA HIGH SCHOOL

PLAN OF ACTION FOR THE PRE-INDUSTRIAL PREPARATION PROGRAM (1971-1972)

A. Program for 1971-1972

Power and Mechanics

B. Selection of Personnel

1. Principal - Ronald Martin
2. Counselor - Arnold Fujii
3. Auto Technology Instructor - Gilmore Youn
4. Math/Science/English Instructor - Russ Thomas
5. Educational Assistant - Jeannette Hines
6. Math Consultant - Arnold Fujii
7. English Consultant - Nikky Mori
8. Science Consultant - Allen Yamada
9. Student Leader - Kimo Andrade

Advisory Board

(1) Wallace Shota - Shop Supervisor, Garden Island Motors, Ltd.
(2) Ted Daligdig - Shop Supervisor, Smith's Bus Line, Inc.
(3) Susumu Hamada - Owner, Hamada Body and Paint Shop

C. Testing

CTBS - Pre-test by September 15, 1971
- Post-test by May 15, 1972

D. Class Schedules

Class schedules for all students completed.

Following schedule will prevail:

Period 1)
Period 2) English, Math, Science

Period 3)
Period 4) Power and Auto Technology

Period 5)
Period 6) Electives

E. Supplies and Equipment

Need to be ordered upon receiving of funds.

F. Program Evaluation

1. Placement and follow up

   a. Who - Counselor
   b. How - Individual records

2. Student opinion survey

   By counselor at end of year.

KOHALA HIGH SCHOOL

PLAN OF ACTION FOR THE PRE-INDUSTRIAL PREPARATION PROGRAM (1971-1972)

A. Program for 1971-1972

Power and Mechanics

B. Selection of Personnel

1. Automotive - Henry Ah Sam
2. English - Yoshimi Nakasone
3. Math/Science - To be appointed
4. Team Leader - Henry Ah Sam
5. Counselor - Martin Clark

C. Orientation

1. Description of Program - Follow Pre-Industrial Preparation Handbook.

2. Behavioral Objectives - Follow Pre-Industrial Preparation Handbook. and incorporate objectives developed in automotive workshop.

3. Student orientation carried out in spring with registration.

4. Staff Orientation - First General Staff Meeting

5. P.T.A. Orientation - First P.T.A. Meeting

D. Testing

1. Pre-test - September
2. Post-test - May

E. Meetings

1. Pre-Industrial Preparation meetings to be held immediately after general faculty meeting the first Wednesday of each month.

2. Special meetings to be held as needed.

F. Class Visitations

1. Open to team members and other staff members during their preparation time.

2. Parents to be encouraged to make visitations - to be scheduled through counselor's office.

G. Budget

To be completed with total school budget at time designated by district.

H. Supplies and Equipment

To be ordered upon budget approval.

I. Instructional Materials Recommendation and Approval

To be made in May for following year.

J. Facilities

Renovation to take place upon availability of funds.

K. Program Evaluation

1. By post-test
2. By teachers, students, and counselor
3. Follow up by counselor

L. Student Selection for Following Year

1. By teacher-counselor recommendations
2. By student desire
3. By SCAT-STEP

KONAWAENA HIGH SCHOOL

PLAN OF ACTION FOR PRE-INDUSTRIAL PREPARATION PROGRAM (1970-1971)

A. Programs for 1970-1971

1. Agricultural Technology
2. Ornamental Horticulture
3. Power and Automotive Technology
4. Metals Fabrication and Processing Technology
5. Building Construction Technology
6. Food Service
7. Cooperative Distributive Education
8. Cooperative Office Education

B. Program Evaluation

1. Placement and Follow-up

   a. Who - Counselor

   b. How - Individual records; Information gathered by personal contacts and correspondence one year after graduation from high school and every other year to ninth year

2. Student Opinion Survey

   a. By counselor before graduation

C. Time Line and Responsibilities

Activity	Completed By	Primary Responsibility
1. Student Selection	6/30/70	Counselor, Vocational-Technical Teachers
2. Testing (Standardized)	9/7/70	Counselor
3. Class Schedules	9/1/70	Administration
4. Teacher Assignment	8/15/70	Administration
5. Staff Orientation	9/1/70	Administration/Team Leaders
6. Facility Preparation	9/1/70	Administration/Teachers
7. Instructional Material Selection	6/30/70	All Team Members
8. Purchasing of Supplies and Equipment	Start 7/1/70 Complete by 5/1/71	All Teachers, Administration

Activity	Completed By	Primary Responsibility
9. Budget Considerations for Current Year:		
Personnel	6/30/70	Administration, All Teachers
CIP	6/30/70	Administration, All Teachers
Supplies and Equipment	6/30/70	Administration, All Teachers
10. Budget Considerations for Next Two Fiscal Years:		
Personnel	6/30/71	Administration, All Teachers
CIP	6/30/71	Administration, All Teachers
Supplies and Equipment	6/30/71	Administration, All Teachers

LAHAINALUNA HIGH SCHOOL

PLAN OF ACTION FOR THE PRE-INDUSTRIAL PREPARATION PROGRAM (1971-1972)*

A. Selection of Personnel

1. Administrator - Ralph Murakami
2. Counselor - Constantine Tgiros
3. Power & Automotive Technology Instructor and Team Leader - Frank Martin
4. Building Construction Instructor - Noboru Miyamoto
5. Agriculture Technology Instructor - Theodore Kawamura
6. English Instructor - Bette Ann Drew
7. Math/Science Instructor - Donald Shimabukuro

B. Pre-Planned Time Schedule

1. Student identification and selection

   a. 95% - Completed May, 1971
   b. 5% - Completed September, 1971

2. Orientation

   a. Staff - September 1, 1971
   b. Students - September 2, 1971
   c. Parents of participants and P.T.A. - September 16, 1971

3. Budget

   a. Review and allocation - July, 1971
   b. Submittal of first quarter purchase orders by September 30, 1971
   c. Submittal of second quarter purchase orders by October 30, 1971

4. Pre-Testing

   a. CTBS - complete by September 17, 1971
   b. Behavior description scale - complete by September 30, 1971

5. Trade Advisory Committee

   a. Establish by September 30, 1971
   b. Determine quarterly meeting dates

6. Conferences, articulation meetings, etc.

   a. Weekly team meetings - Tuesdays, 2:00-2:45 p.m.
   b. Monthly staff meetings with administration - Thursdays
   c. Student session with administration - September, January, and May

7. Post-Testing

   a. Behavior description scale - complete by May, 1972
   b. CTBS - complete by May, 1972

*This is a second year plan of action.

8. Program Evaluation

a. To be done on a continuous basis at weekly and monthly meetings.

b. Review and analysis of test results - May 15, 1972.

c. Submittal of program evaluation by each team member - June, 1972.

d. Administer school developed evaluation instrument to students by June, 1972.

e. Submittal of program evaluation to district and state office - June 15, 1972.

WAIANAE HIGH SCHOOL

PLAN OF ACTION FOR PRE-INDUSTRIAL PREPARATION PROGRAM (1970-1971)

A. Programs for 1970-1971

Pre-Industrial Preparation Program

Cooperative Distributive Education
Cooperative Office Education
Cooperative Agricultural Education
Auto/Power Tech. Education
Cooperative Industrial Education

B. Time Line on Activities

1. Student selection -- most of selection done (May, 1970), final selection in August, 1970

2. Testing -- completed in May, 1970

3. Class schedules -- May, 1970 (completed)

4. Instructor selection -- all teachers selected for the program should be final by August, 1970

5. Orientation -- last week of August, 1970

6. Facility preparation -- throughout school year

7. Textbook selection -- recommend 1 year in advance. Books should be evaluated throughout the school year.

8. Budget consideration -- one year in advance (summer)

9. Ordering supplies -- June-August, 1970

10. Program evaluation -- follow up - teacher and counselor

    a. Survey
    b. Letter
    c. Personal contact

APPENDIX C

TASK ANALYSIS

TASK ANALYSIS

Digested from Developing Vocational Instruction,
by Robert F. Mager and Kenneth M. Beach, Jr.

A task is a logically related set of actions required for the co. letion of a job objective. A job or vocation includes a number of tasks. For example, one of the tasks that must be performed by the auto mechanic is that of adjusting brakes. All of the steps involved in adjusting a brake go to make up the complete task.

The first step in task analysis requires a listing of all the tasks that might be included in the job. The tasks can probably be identified and listed by just thinking about the job. But a much better list can be done by talking to individuals now working at the job or by watching the tradesman actually performing the job. This should help to refresh your memory and help you to avoid a serious teaching trap -- loading the course with irrelevant content.

Talking to the man on the job will tell you what the job is. Talking to the supervisor will tell you what it ought to be. Judgment will have to be made as to which tasks are reasonable to include in your list based on probability of need.

A note of caution -- You will not be teaching all of the tasks you list in your analysis. Some will be deleted because of its insignificance. But the important thing is to list all the tasks that go to make up the vocation.

It will be useful to list all these tasks on a simple form so that you can easily record the information you need to put down next. (See the sample form on the following page.)

The first column indicates how often each task is performed during the performance of a job. Do not try to think about the importance of the task. Just indicate the frequency with which the task is performed. This information will become very useful in deciding how deeply to go into the subject, how much practice to provide, and how to sequence the course lessons.

All tasks are not of equal importance in the performance of a job. Tasks that are performed frequently may not represent a critical skill. Other tasks, although performed rarely, are vital to job performance. For example, although a waiter must know how to clean off a table and may perform this task frequently, it is not nearly as important to the job as his ability to take orders correctly. Therefore, indicate the judgment of importance. Then, you will be able to determine which tasks must be included in the training and which can be left out if some selection becomes necessary.

The third column of the form requires your best estimate of whether each task is easy to learn, moderately difficult, or very difficult to learn. This information will also help you to determine the length of time that should be spent in teaching the task.

TASK LISTING SHEET

Vocation: Electronics Technician

No.	Task	Frequency of Performance	Impor-tance	Learning Difficulty
1.	Troubleshoots and repairs malfunctioning equipment	Everyday occurrence	1	Difficult
2.	Reads electronic schematics.	1 to 10 times a day	2	Moderate
3.	Performs chassis layouts.	Once a week	2	Easy
4.	Uses small hand tools.	Continuously	1	Easy
5.	Checks electronic components.	Frequently	1	Moderate to very difficult
6.	Replaces components.	Once in a While	2	Easy to Moderate
7.	Solders various components.	Frequently	2	Moderate
8.	Recognizes the applica-bility of electronic test equipment.	Once in a while	2	Difficult
9.	Interprets test instruments.	Frequently	1	Difficult
10.	Performs calibration of test equipment	Once a month	3	Difficult
11.	Interprets and records test data.	Once in a while	3	Easy to Moderate
12.	Specifies and orders electronic components.	Frequently	3	Easy
13.	Applies first aid procedures.	Very rarely	1	Moderate
14.	Maintains and cleans work areas.	Frequently	2	Easy

Listing Operations

The second step in task analysis is to list the operations involved in each of the tasks on the list in terms of what the person does when performing the task. This step emphasizes what is done, rather than in terms of what must be known.

The following is an example of a task that has been broken down into its main operational steps.

Example 1

Job or Vocation: Electronics Technician

Task: Soldering components

Operations involved:

1. Identify joints to be soldered.
2. Select the appropriate iron and solder.
3. Clean joint and tin if necessary.
4. Place the iron on the joint.
5. Apply the appropriate amount of rosin core solder to the joint.
6. Check and examine the joint; seal if necessary.
7. Clean surroundings and replace the tools when finished.

While this may seem to be going into unnecessary detail, it must be stressed that these steps are essential in making intelligent choices of teaching techniques. With the task steps identified in this detail, we can better avoid the teaching trap of including more theory than is necessary or desirable and keep the course performance oriented.

There are probably as many techniques for performing a task analysis as there are people doing it. The technique described here, while not merely as detailed as some, is adequate for the job at hand. If you know of another technique that suits you better, by all means use it. The only large error you can make is not to use any task analysis technique at all.

APPENDIX D

PROGRAM EVALUATION INSTRUMENT FOR PRE-INDUSTRIAL PREPARATION PROGRAM

GENERAL DIRECTIONS

1. Check the appropriate block on the top left of the page to identify your role, and write in the name of the school and the date.
2. Answer all questions that pertain to you or your duties.
3. Any elaborations may be made in the space provided below the question.

Other information to be included as evaluation data:

1. Results of the CTBS scores (Pre and Post Tests).
2. Summary of student attitude profiles, Behavior Description Scale (Pre and Post Rating).
3. Results of Job Placement and Follow-Up Study.

/ / Vocational Teacher

/ / Related Subject Teacher

/ / Counselor

/ / Administrator

/ / Other _____
specify

_____
School

_____
Date

PROGRAM EVALUATION
PRE-INDUSTRIAL PREPARATION PROGRAM

1. How often do you meet as a team for the PIP Program?

   / / 1 to 3 times/week / / 2 times a month / / Once a month

   / / Other (specify)

2. How often do you meet with (related/vocational) subject teachers? (Underline appropriate one.)

   / / 1 to 3 times/week / / 2 times a month / / Once a month

   / / Other (specify)

3. How often do you meet with the (counselor, vocational-technical teacher) to discuss student problems?

   / / 1 to 3 times/week / / 2 times/week / / Once a month

   / / Other (specify)

4. What is your personal opinion about the PIP Program?

   / / Good / / Not working according to the intent of program / / Not worth having

   / / Other (specify)

5. How do you perceive the non-participating faculty members' acceptance of the PIP Program?

   / / Worthwhile having / / Not doing any good / / Just another federal program

   / / Other (specify)

6. How do the students feel about the program?

   / / Good / / Indifferent / / Poor

   / / Other (specify)

7. How were students identified for the program?

/__/ Counseling /__/ Recommendation /__/ Test scores

/__/ Own choice /__/ Other (specify)

8. What is your feeling about administrative support for the program?

/__/ Weak /__/ Strong support /__/ Fair

/__/ Other (specify)

9. Are you given ample time to meet with other team members?

/__/ Yes /__/ No /__/ Other (explain)

10. Was any job task analysis done to determine the occupational competencies that need to be taught?

/__/ Yes /__/ No /__/ Other (specify)

11. Have you written student performance objectives for your instructional program?

/__/ Yes /__/ No /__/ Other (specify)

12. Do you have an advisory committee for your instructional program?

/__/ Yes /__/ No /__/ Other (specify)

13. Do you actively use the advisory committee in evaluating and implementing certain phases of your program?

/__/ Yes /__/ No /__/ Other (specify)

14. Does this instructional program provide students with on-the-job experiences?

/__/ Yes /__/ No

15. If answer to item 14 was yes, then how many employers are associated with this instructional program in providing work-training stations?

/_____/ Employers

16. Does this instructional program provide students with simulated work experiences in the classroom setting?

/__/ Yes /__/ No

17. Is individualized instruction made available to vocational students in this program who have peculiar educational deficiencies?

/__/ Yes /__/ No

18. Check one or more items which best describe the source of the curriculum materials used in this instructional program.

/__/ Original by local staff

/__/ Standard state curriculum guide

/__/ Commercially prepared materials

/__/ Adapted from similar programs

/__/ Developed by special agency or association

(specify) _____

/__/ Other (specify) _____

19. Indicate the year in which the next job analysis will be done to update the occupational competencies that need to be taught.

/__/ This year

/__/ Next year

/__/ Within the next two years

/__/ More than two years from now

/__/ Unknown

20. Do the total schools vocational and general education staffs jointly organize curriculum offerings for students in the PIP instructional program?

/__/ Yes /__/ No

21. Did you have sufficient equipment and supplies to carry on a good program?

/__/ Yes /__/ No (explain)

22. What is your opinion about the program facilities?

/__/ Good /__/ Fair /__/ Poor

/__/ Other (explain)

23. Were sufficient funds provided for your program?

/__/ Yes /__/ No (explain)

24. Were sufficient resource materials available?

/__/ Yes /__/ No (explain)

25. What are the chief weaknesses of the program? (List)

26. What are some of the strengths of the program? (List)

APPENDIX E

VOCATIONAL-TECHNICAL COURSES OF STUDY AVAILABLE IN THE HAWAII SECONDARY SCHOOL PROGRAM

APPENDIX F

BEHAVIOR DESCRIPTION SCALE

Developed by Ohio State University,
Management Science

Date _____

Student's Name _____

Instructor's Initials _____

BEHAVIOR DESCRIPTION SCALE

Directions: Please use the following items to describe the behavior of the student named above. DRAW A CIRCLE around one of the letters - A B C D E - after each item to show how frequently he behaves as described by the item.

A = Always
B = Often
C = Occasionally
D = Seldom
E = Never

1.	Tries hard	A B C D E
2.	Follows directions carefully	A B C D E
3.	Completes assigned tasks	A B C D E
4.	Loafs on the job	A B C D E
5.	Resents being told what to do	A B C D E
6.	Has a chip on his shoulder	A B C D E
7.	Seems to resent authority	A B C D E
8.	Creates disturbances	A B C D E
9.	Becomes angry when mistakes are called to his attention	A B C D E
10.	Is insolent and discourteous	A B C D E
11.	Exhibits "don't care" attitude	A B C D E
12.	Gets along well with other students	A B C D E

Note:
To be used independently by at least three teachers, counselors, or administrators who have close contact with the student, once in the fall semester and at another time close to the end of the school year. Scores to be recorded in the individual student's profile for evaluation purposes.

Date _____

Student's Name _____

Instructor's Initials _____

BEHAVIOR DESCRIPTION SCALE

Directions: Add the numbers that appear in the circles for items 1 to 12 and enter the total score at the bottom.

A = Always
B = Often
C = Occasionally
D = Seldom
E = Never

1.	Tries hard	5	4	3	2	1
2.	Follows directions carefully	5	4	3	2	1
3.	Completes assigned tasks	5	4	3	2	1
4.	Loafs on the job	1	2	3	4	5
5.	Resents being told what to do	1	2	3	4	5
6.	Has a chip on his shoulder	1	2	3	4	5
7.	Seems to resent authority	1	2	3	4	5
8.	Creates disturbances	1	2	3	4	5
9.	Becomes angry when mistakes are called to his attention	1	2	3	4	5
10.	Is insolent and discourteous	1	2	3	4	5
11.	Exhibits "don't care" attitude	1	2	3	4	5
12.	Gets along well with other students	5	4	3	2	1

Total Score

Note: The total score ranges from a low of 12 to a high of 60.